The Grain Brain:
A Special Interview with Dr. David Perlmutter

By Dr. Joseph Mercola

JM: Dr. Joseph Mercola

DP: Dr. David Perlmutter

Introduction:

JM: Welcome, everyone. This is Dr. Mercola, and today I am joined by Dr. David Perlmutter, who is a neurologist, actually probably the leading natural health or natural medicine neurologist in the entire country from my perspective. I don’t know anyone who exceeds his level of expertise and still shares the same philosophical orientation that we have.

He has a clinic down in Florida, and he’s been very active in publishing in the peer-reviewed medical journal. He’s also a fellow of the American College of Nutrition, as I am. We’re both fellows in that college, and it’s a really good group to be a part of. He’s going to enlighten us today about some really important topics. So, welcome and thank you for joining us.

DP: Well, I’m very honored and glad to be here. Thanks.

JM: Maybe you can provide our viewers with a perspective or framework of how you made this transition. Because it’s always different for physicians who are passionate about using natural therapies to get people better as an alternative to the traditional approach or the conventional approach.

DP: That’s a very good place to start. I have a very strong background actually in traditional neurology. As a neurologist for many years, I became more and more frustrated with our lack of ability to actually treat diseases. We were really only treating symptoms. When I finally began to understand what the approximate cause of the various illnesses we were dealing with was, I realized that mainstream neurology, though I don’t want to sound too critical, really pays no attention to the causation part of the story.

Why are our patients developing things like dementia and Alzheimer’s disease? Why are our children developing ADHD? Why is it such an incredible number of women more than men are developing autoimmune problems like multiple sclerosis? I realized it wasn’t going to happen by simply writing prescriptions each day and hoping people would be merry on their way.

I began investigating the role, oddly enough, of nutrition (who knew?) on brain health. It’s really quite astounding that I would be asking my patients, “What foods do you eat?” A pretty breathtaking question, pretty bold. I mean, that’s a brand-new concept in medicine and only at least goes back to Hippocrates. Who knows how many thousands of years before that? But I
began realizing that nutrition and lifestyle issues play a fundamental role in determining who will and who won’t get a devastating neurological problem.

You know, Dr. Mercola, we live at a time in this country where more than 5.4 million of our brethren have been diagnosed with Alzheimer’s disease. That is a disease for which there is no treatment. It is a disease, according to the RAND Corporation, that’s causing us 200 million dollars a year, and yet it is largely preventable. No one’s talking about that. This is a disease that is highly revenue-producing for mega factories of various so-called Alzheimer’s drugs.

The point is there is no meaningful treatment in 2013. It is a disease predicated on lifestyle choices primarily because of the high amount of carbohydrates/sugar that we now, as Western-culture individuals, are consuming. It’s a preventable disease. It surprises me at my core when we’ve recognized that no one’s talking about the fact that so many of these devastating neurological problems are, in fact, modifiable based upon lifestyle choices.

JM: It sounds like, upon reviewing your materials, that one of the choices you made is to look at autoimmune diseases, specifically the impact of gluten and casein, or wheat and dairy primarily, on autoimmune diseases. I’m wondering if you can expand on that.

DP: That’s really why the book is called Grain Brain. The cornerstones of the new book are the very powerfully toxic role of glucose (sugar) and carbohydrates in the diet. Also, fundamentally, this new recognition that, in fact, gluten sensitivity, because of what it does to the immune system, is a cornerstone in any manner of disease affecting humanity and my interest, of course, the brain.

Recognizing that we used to think – unfortunately, many physicians still believe – that you if don’t have celiac disease, gluten is fair game. Eat as much as bread and pasta as you like. We know that celiac disease, which is simply gluten sensitivity affecting the small intestine, may indeed involve about 1.8 percent of Western individuals, Western cultures. But the picture, as it remains to being sensitive to gluten, may be as much as 30 to 40 percent of people.

According to Dr. Alessio Fasano now at Massachusetts General Hospital, we all react to gluten. A 100 percent of humans create something called zonulin in the intestine as a response to consuming gluten, this protein found in wheat, barley and rye. This then leads to what we call permeability of the gut, opening up the cells in the gut, making the gut actually more permeable, and allowing proteins to get in the bloodstream. That then sensitizes the immune system and leads to things like increased inflammation and autoimmunity.

The relationship (you bring up a very interesting point) between not only gluten and then subsequently other proteins like casein and other things found in dairy products really deals with the work of Dr. Fasano. Once gluten sensitizes the gut, then those junctions are open. The gut becomes more permeable and all manner of previously excluded proteins have direct access to the bloodstream and challenge the immune system.

You can also make that happen even if there’s not a gluten reaction by bombarding the intestines, for example, with chlorinated water or antibiotics. These days, need I say, mainstream medicine tends to aggressively overuse antibiotics, which does tend to upset the balance of organisms in the gut and then also tends to lead to this hyper-permeability situation. In other words, the leaky gut syndrome that many people sentence their self with.
They’ve been talking about it for years and years (which is now just gaining traction in mainstream medicine) that our health really depends on maintaining a barrier of the intestine from the bloodstream. We now understand that the so-called blood-brain barrier, or that barrier that keeps things out of the brain where they don’t belong, is also affected by gluten, according to new research.

It’s a very exciting time when we recognize that our biggest exposure to the environment is actually the lining of our intestines – not our lungs, not our skin. We are, in fact, very much dependent on the microbio, on the bacteria living in the gut, to really maintain order and maintain our health.

**JM:** Yes, indeed. I’m wondering if you’ve noticed a response, an increased negative response, to casein in certain subpopulations like Irish or English people. It seems when I was practicing that the percentage was well over 90 percent of those individuals with strong heritage to those populations that reacted adversely. I mean, the overall is 40 percent, but if you’re Irish or English, I think you even have another significant level of concern.

**DP:** There is no question that there is some genetic predisposition here for these problems. Dr. D’Adamo wrote years ago about eating right for your type, eating right for your blood type, tracing the migration of people, and therefore their genetics in terms of their response to consuming certain foods. There’s no question about that.

But I think it is a real question of us contaminating our immune systems, if you will, with proteins to which the immune system has never in the history of humankind been exposed to. We recognize that food is far more than protein, carbohydrates, fat, and micronutrients, and that food really does represent information. The foods that we consume are instructing our genes. Therefore, that’s a very empowering notion: we can change our genetic destiny based upon the food choices that we make.

**JM:** You know, I’m reminded, too, of another neurologist, a female neurologist from Russia, Dr. Natasha Campbell-McBride, who has also done work in this area and treats her son who has autism, obviously a neurological challenge. She invested much of her time to finding a solution for him. As a result, she came to the same conclusion that you’re speaking about now, that this requires a severe restriction of gluten and casein to have an improvement.

Her observations or beliefs revolve around that actually part of the reason that they perpetuate is that there actually are formed various substances very similar to morphine. They cause this addictive cascade that perpetuates the process.

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Because normally, people wouldn’t want to necessarily engage or consume something that’s going to make them worse. But because of this addiction component, it tends to develop this domino effect that perpetuates this cycle.

**DP:** With very specific response to your comments about autism, we do know that some of the milk-related proteins tend to lead to antibody production in the brains of autistic children, blocking what’s called the folate receptor, as fate would have it. Therefore, one of the
propositions is that there’s this blockage of the ability of folate to get into the brains of certain children, and this leads to all kinds of cognitive and neurocognitive issues.

The State University of New York has actually developed a screen for looking at folate receptor antibodies. We have found that to be actually very, very helpful. It turns out that some of these kids, their blood levels of folate are very high or at least normal. It’s misleading because it’s not getting to any of the brain. The gates are closed to folate, which is a fundamental nutrient for the brain, to having that folate get into the brain. We often have to treat these children with exceedingly high dosages of folic acid to get higher levels and force it basically into the brain.

But I think your part is well-taken. It’s a very exciting time for those of us not just in neurology, but in all branches of medicine who are suddenly realizing that we’ve come full circle. We’re now back to understanding that nutrition plays a pivotal role in the health of humans.

I often open up lectures when talking to professionals by telling the story of how many years ago my wife and I took our dog to the vet because Ticko was losing his fur. I show a picture of our dog in the lecture. People would think how rare this is and where could this lecture be going because there’s a picture of my dog at a professional lecture. I tell them how the first question the vet asked us was, “What are you feeding your dog?” as you would expect.

It was a pivot point for me because we were very comfortable with that. Of course, the vet would want to know what kind of food we’re feeding the dog because it plays a role in its health. But even more dramatic was the feeling that I got when I realized that it would be considered so strange or so foreign if the first question your doctor were to ask you when you sat down and get examined was, “What are you eating?”

But why is it any different? Food is fundamentally important for human health. It’s not about the drugs that you’re given when you walk out of the doctor’s office. Do we use pharmaceuticals? Absolutely. Is there a role for pharmaceuticals? No question. But at the end of the day, this neurologist is saying that food matters to health, longevity, and prevention of disease. It becomes a very empowering notion.

**JM:** Yes, indeed. Certainly, when I was practicing, that was one of the primary questions that I would have on my intake form, to find out specifically all the foods they were eating and the timing of them.

**DP:** Yes. Let me say one more thing about food. It’s the second time now you referred to “when you were practicing.” I will just remind you that the word “doctor” means teacher. So, you’re continuing to practice. I mean, the work that you’re doing is really, absolutely… You’re personifying the word “doctor” by your outreach in terms of getting information to the public.

**JM:** Yeah.

**DP:** I feel that you’re really still very, very much engaged, more so than many practitioners.

**JM:** Well, thank you for those kind words. It was a tough decision about seven years ago when I decided that there’s only so much time in life. I thought it’d be more effective to leverage my time by teaching people through the Internet. That’s what I’m doing.
So, I’m wondering. It’s probably wise for most people to avoid dairy and gluten – wheat primarily. But is there any specific test that you use to identify subgroups who are particularly prone or who may not have as much challenge if they consume them?

**DP:** I believe that generally people should avoid gluten-containing products beyond wheat. In other words, barley and rye as well.

**JM:** Excuse me. One moment, too, because I said “dairy,” I want to be more specific. Because it’s really the milk protein – casein and the other proteins – that are challenged. Milk or dairy fat like butter, which has virtually no protein, is not problematic. I consume personally about a pound a week. I think it’s the protein that’s the issue. I just wanted to clarify that.

**DP:** Butter. How awful that must be? It’s breathtaking that we’re having a discussion here about consuming dietary fat. I always thought dietary fat was this horrible thing. It’s breathtaking. My first trick question… I always have a couple of trick questions for my patients. The first trick question is how much fat do you have in your diet? They always say, “Oh, we’re on a very strict diet.” I’ll tell you the other trick question in a moment.

Because, you know, what you and I are suggesting is that we need to eat fat. We’re suggesting a revolutionary dietary change, really telling people they should go on this new diet, which is only the diet humans have eaten for the past 2.6 million years. We’ve always eaten fat. Fat is the most wonderful health-providing food that we can obtain in the human diet. Of course, we have to qualify that with what type of fat you are eating. Here you are, telling your listeners that you are consuming high amounts of butter.

A lot of professionals and certainly a lot of listeners, that’s going to make the hair on the back of their neck stand up. But in reality, what you’re doing is exactly right. Whether it’s organic butter, clarified butter called ghee, or lots of pure fat called organic virgin olive oil or coconut oil, nuts and seeds, free-range chicken, or wild salmon, these are high-fat foods. Avocado, one of my favorites.

It turns out that the fat phobia that we are experiencing in Western cultures and certainly in the United States has absolutely been the cornerstone of our most common degenerative diseases of the day, including Alzheimer’s. Because when you cut dietary fat and you keep protein about the same, you’re going to fill in those categories by the very foods that you’re discussing: high-carbohydrate foods, predominantly grain.

This whole grain goodness, as the U.S. Department of Agriculture is trying to convince us we should focus on in terms of our dietary choices, is the cornerstone of our most devastating diseases. I mean, brain diseases like Alzheimer’s, cardiovascular disease, and obviously, what leads to them, diabetes, which is so prevalent in Western societies. Again, it’s the getting away from fat and the substitution with wheat-based carbohydrate and corn-based carbohydrate (high-fructose corn syrup) that really, in my opinion, explains this huge explosion of degenerative conditions that are crippling us medically and crippling us economically as well.

**JM:** Okay, so, thank you for expanding on that. I’m wondering though if there are any specific tests that you find useful clinically in the implementation of your low-to-no-gluten-and-casein strategy.
DP: I think what I have found to be the most effective test is a test called Cyrex. This is a test for antibodies related to gluten sensitivity. Most standard laboratory studies…

JM: Excuse me, is that the name of the test or the name of a company?

DP: It’s the name of a company. I’m not sure if you’re able to put that out.

JM: Okay. No, we can. Sure. So, a physician would have to order this through Cyrex?

DP: Pardon me?

JM: A physician would have to order this through Cyrex?

DP: Correct.

JM: Okay.

DP: Let me just answer that question again.

JM: Oh, sure. Yeah, that would be good.

DP: Okay. The test that I have found to be really, I think, the most effective in terms of gluten sensitivity is a test called Cyrex. Their specific test is number 3, the Cyrex Array 3 test. Most laboratories, when you order a test for gluten sensitivity or even more narrow-mindedly a test for so-called celiac disease, will look at antibodies against one type of gliadin. It’s an anti-gliadin antibody. There are a dozen types of gliadin that can incite immune reaction or immune reactivity. The beauty of the Cyrex test is it looks at 24 different parameters of gluten sensitivity.

Most commonly when I’m seeing patients, they’ve already had some form of preliminary gluten sensitivity test which was negative, and we find that by doing the Cyrex test.

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That same lab offers another test, Cyrex Array 4, which looks at cross-sensitivity in people who are gluten-sensitive. It’s there you will find the dairy product panel as well as amaranth, spelt, quinoa, rice, coffee, chocolate, and other things that we hate to give up, unfortunately, but that may be cross-reactive with respect to gliadin.

But as long as we’re talking about testing, medical testing, and what I find valuable, there is a couple of simple testing every patient probably has, but they may not fully understand the implications in terms of brain health. Like fasting blood sugar, for example: this is a powerful test that directly predicts a person’s risk for Alzheimer’s disease.

If I can call up the first slide, what you see here: this is actually from a study published in the journal Neurology. This was a slide that was from a research publication last year. What they did was they measured people’s fasting blood sugars. They did a test called the MRI, which measured the size of their brain memory center called hippocampus. And then four years later, they brought these people back to the lab and measured the size of their memory center again.

As you can see in the slide, there’s a direct correlation between their fasting blood sugar and the rate at which their brain shrunk. That’s very, very powerful, meaning higher levels of blood
sugar. What is so incredible here is that these are blood sugars that are still in the 90s or in below 100, which most people would consider in the normal range. But any small elevation of blood sugar directly correlates to increasing risk for having shrinkage of your hippocampus, your memory center. That’s a cornerstone of Alzheimer’s disease.

In this next slide, it’s a similar study looking at our blood test called hemoglobin A1c. For those of your listeners who are not diabetic, they may not have ever heard of the hemoglobin A1c. But it’s basically a lab test that any doctor can do and any lab will do. It’s a marker of a person’s average blood sugar over about a three-to-four-month period of time. Again, you see the striking correlation between hemoglobin A1c and the weight at which your brain is shrinking.

What’s so empowering about these two ideas – blood sugar and hemoglobin A1c – is it’s a powerful leverage point. You can control hemoglobin A1c by lowering your carbohydrate consumption. You can absolutely control your blood sugar. It’s a lifestyle choice. Do you eat grain? Do you drink orange juice in the morning? Are you having cereal in the morning? Have you decided to go low-carb and high-fat? In which case, your hemoglobin A1c will come down, your fasting blood sugar comes down, and lo and behold, you have taken positive steps to reduce the risk of having your brain shrink.

Now, we know that there’s a similar risk of brain shrinkage based upon your genes or based upon inheriting the so-called Alzheimer’s gene. You really can’t have much control over that obviously. But here are powerful leverage points demonstrating that simple lifestyle changes – going to a lower-carb, higher-fat diet – reduce the risk at which your brain shrinks. I find this to be very, very empowering information.

**JM:** Yes, indeed. A few questions. I appreciate your comments on low-carb, higher-fat because the traditional approach to low-carb, you know, certainly when I first started exploring this area, was Dr. Atkins’, who has long since passed away, 10 years ago or so. He didn’t really differentiate between that. All he focused on was low-carb and didn’t really actually address the quality of the fat so much either.

But what most people, I think, mistakenly use when they apply this system is a high-protein diet. Protein in high concentrations will actually revert to carbohydrates, in addition to having its own metabolic disasters. This is really a relatively low-protein to low-to-moderate-protein, high-fat, low-carb.

**DP:** That report is very well-taken. Indeed, when people cut the carbs, they need to regain those calorie sources from either protein or carbohydrate. I actually just saw a picture yesterday of an average-sized man who is consuming, because he had cut his dietary carbohydrates down, 200 grams of protein each day, adding in protein [inaudible 25:02]. We notice a gluconeogenesis or the production of glucose de novo, that he was raising his sugar. In fact, his average blood sugar or haemoglobin A1c was 6.2, which is dramatically elevated.

But I will say that in the *Journal of American Medical Association*, I believe, in 2007, there was a head-to-head comparison of the Atkin’s diet, the traditional recommendation by the American Heart Association, the Zone diet, and the Dean Ornish, very low-fat, higher-carbohydrate diet. It’s called the A-Z trial.
What the study revealed, which was really quite remarkable, was in looking at all of the important cardiovascular risk wonders that we like to examine or determine if a person is at risk for heart disease, for example – including triglycerides, fasting sugar, fasting insulin, etc. – the Atkins’ high-fat, low-carb diet beat out the other diets every time.

A similar study actually appeared in the *New England Journal of Medicine* comparing Mediterranean, high-fat, and high carbohydrate diets. Once again, the higher-fat diet is proven to be the most effective even in lowering those important cardiovascular risk markers.

I gave a lecture in February this year at the Integrative Healthcare Symposium in New York, and I was using that as one of my slides – the A-Z trial. I said, “You know, Dr. Atkins many, many years ago was really onto something in terms of really getting as back to consuming more good fats.” At the conclusion of my lecture, a woman came up to me and had tears in her eyes. I said, “Gee, what did I say? What has moved you so?” I looked down at her name badge. It was Dr. Atkins’ wife, Mrs. Atkins. She said she was just really honored that her husband had been recognized in that way.

But I think, Dr. Mercola, you bring up a very good point. The quality of the fat that we consume is absolutely fundamental. When we’re saying high-fat diet, we’re not talking about prepared foods on the Twinkie aisle at the grocery store that contain modified trans, hydrogenated fats that are clearly coffin nails. They’re a great risk for brain disorders, heart disorders, diabetes, etc. We’re talking about these beautiful, natural fats that we have been consuming for more than two million years.

And yes, as you mentioned, animal fats – eggs rich in health-providing saturated fat – are wonderful for the brain and wonderful for the heart. A wonderful report came from an academic center in Long Island and was published just last month, reviewing how important saturated fat is in the human diet and really distancing this notion that saturated fat correlates the risk for heart disease. Nothing could be further from the truth.

**JM:** I have a question on the slides that you showed. There’s sort of a straight-line relationship between the glucose level and the shrinkage of the memory center. There’s a transition that seems to occur at about the level of 90 that implies that it’s a negative shrinkage. I’m wondering if, you have a lower glucose that, in fact, the brain doesn’t shrink but actually continue to grow.

And as an extension of that, because the conventional, long-held wisdom of brain tissue or nerve tissue is that it doesn’t regenerate; it doesn’t repair and heal. So, if, in fact, you lower the glucose level, can you reverse the process? I’m particularly interested because my last fasting glucose was 68. I try to keep mine really low.

**DP:** What a notion. I mean, when you and I went to medical school, we were told two things that have been absolutely upended. The first thing we were told was that our DNA existed basically in a glass case, it turned into what you would be, and it couldn’t be modified. The other that we were told was that we received a hundred billion brain cells by about 18 years of age, and that was it. We never grew any more brain cells.

I remember they would say, well, every time you drink a beer, you lose, whatever it was, 20,000 or 30,000 brain cells. We were always on this downhill skid for the rest of our life. Well, both of those notions have been upended. They’re very much related.
First of all, we know that every activity at which we engage – be it physical activity (exercise), the foods we eat, the supplements we take, the relationships that we have, our emotional state, the sleep that we get – all dramatically and moment to moment influence our genetic expression.

By all means, our genes are not locked up and deterministic. We interact with our genome every moment of our lives, and we can do so very, very positively. Keeping the blood sugar low, as you mentioned, is a very positive issue in terms of allowing the genes to express that reduced inflammation, which increase the production of life-giving antioxidants. That’s rule number one: we can change our genetic destiny.

Rule number two: we can change our genetic destiny to grow new brain cells, specifically in the exact area that I have just depicted in these slides – the hippocampus. The human hippocampus, the brain’s memory center, regenerates. We are constantly growing new brain cells into our 50s, 60s, 80s, and 90s – throughout our lifetime – through a process called neurogenesis. What a cool word, neurogenesis. I love that. I wish I owned a dot-com.

But that said, these two ideas come together because we can turn on our genes through lifestyle choices that enhance neurogenesis and that enhance regrowth of cells and expansion of the brain’s memory center. This was proven by researchers recently. They demonstrated that there are factors under our control that can make that happen. Predominantly aerobic exercise, reducing calorie consumption overall, reducing carbohydrate consumption, and adding in an omega-3 called DHA all target a specific gene pathway called BDNF or brain-derived neurotrophic factor that leads to growth as demonstrated on MRI scans.

Over a one-year period of time, those individuals who engaged in exercise were actually growing and expanding the brain’s memory center one to two percent per year in a situation where that center would otherwise have continued to decline in size over a one-year period. What an amazing concept: we can grow back our memory center.

These individuals who were in that study were also demonstrating to have improved memory function. It’s not just that the brain got bigger, but the memory function improved in a time in which there are no medications or whatsoever that have any effect on improving memory. Here are the keys: reduce calorie consumption, increase fat consumption, take a DHA supplement, get aerobic exercise – and you’re going to turn on your gene pathway to grow new brain cells.

That, again, I think, is very, very empowering. This is the information that I think our public needs to understand at a time when we’re having to deal with between five and six million Americans with Alzheimer’s disease. Again, it’s a preventable situation.

**JM:** Yes, indeed. The prescription you advocated to reduce Alzheimer’s actually is the exact same prescription that’s recommended to reduce the two other major epidemics, both of which are larger than Alzheimer’s; heart disease and the emerging one, cancer.

**DP:** Yes.

**JM:** This is the same prescription, the same identical prescription.
DP: Brilliant.

JM: Yeah. I’m glad to know that the brain cells grow because I was familiar with another really cool neurological term, which is neuroplasticity, that the function of the brain can improve with time when you do the exercises and apply the recommendations you recommended. But I was wondering… Actually, I forgot what I was wondering because I went off on a tangent.

DP: That’s the neuroplasticity that happened. I don’t know that you rehearse. I think your viewers need to know that this was not rehearsed. But that is absolutely the perfect leading question for me right now, because all of the same issues that I just mentioned that turn on this hormone, this growth hormone called BDNF, lead to increased neuroplasticity, the connection of brain cells. The effect of Dr. Hebb, you know.

Dr. Hebb was a researcher in Canada in the 40s and 50s. He was exploring what is it that leads to the connection of brain cells, which you just beautifully described: neuroplasticity, the brain being plastic and able to remodel itself, a fundamental in learning. It turns out it is exactly the same lifestyle controllable factors – reducing our calorie consumption, getting aerobic exercise, taking a DHA supplement, and making sure that we have adequate amounts of good fats in the diet. These are fundamentals. But what’s even more important, which you alluded to as well, is that these are now the same fundamentals across the spectrum of the so-called medical disciplines.

When I lecture to groups of professionals, it’s often on the heels of somebody else’s lecture, who was just talking about heart disease or may have been talking about autoimmunity or cancer, as you bring up. More and more, as we move forward in time, all of our seemingly disparate ideas about what people should do are coming together. They are coalescing to the same message that what is our own doing is this high-carbohydrate, low-fat is the fundamental of the standard Western diet, and nothing could be worse for us in terms of all of those issues. It’s absolutely controllable. We’ve got to get the message out.

There’s nothing proprietary here. There’s nothing that anyone is selling. There’s nothing to buy. It is simply cutting your carbohydrate consumption, increasing your consumption of dietary fats, and getting some aerobic exercises. If you’re going to buy something, go and buy a fish oil product, an algae-derived DHA product, some source of DHA, or eat fish. These are the keys to health.

JM: I don’t recommend supplements routinely as a primary intervention or ever really. It’s the diet first. Everyone knows that. I’ve been preaching that for a long time. But I’m wondering… There is a particularly useful antioxidant that I’ve recently encountered – astaxanthin – which seems to be one of the most profoundly effective tools as an antioxidant and particularly noted for the improvement or reduction of advanced age-related macular degeneration and Alzheimer’s.

I’m wondering, as a practicing neurologist, if you’ve noticed any improvements or recommended that therapeutically and seen changes as a result of that intervention, especially at a higher level like 12 milligrams or even 20 milligrams.

DP: Yeah, astaxanthin is actually very interesting. As you well know, it belongs to the class of carotenoids and as such is very focused, if you will, on reducing free radical-mediated damage to
fat, and the brain is 60 or 70 percent fat. Astaxanthin plays a very cool role in the brain in terms of protecting the memory. That’s the argument that people give in terms of giving a krill oil supplement, for example, because while it’s marine-based, it does have astaxanthin in it. There are things about krill oil that I am less favourable towards.

Again, I would indicate that, like yourself, I focus on food first. Food first is really the way to go. But there are a handful of pretty powerful supplements, astaxanthin being one of them, that I think play critical roles if you are already well along the path in terms of already manifesting problems from the damaging effects of free radicals.

What’s so little recognized, for example, is this fundamental role of plain old vitamin D in terms of brain health, immunity, and inflammation. For years, everyone’s focused on vitamin E because it’s the “make your bone strong” vitamin. In reality, the situation is that vitamin D is a pivot point, a cardinal player in terms of brain health.

I came through this notion of epigenetics modifying gene expression. Vitamin D modifies the expression of more than 913 genes. What a powerful notion that this vitamin – actually not even a vitamin, it’s actually a steroid hormone – controls the expression of more than 900 genes.

The deficiency of vitamin D that I’m seeing every day – because I measure it in every one of my patients – is almost all-encompassing in Western cultures. People are dramatically low in vitamin D and have been fearful of vitamin D inappropriately for way too long.

I ask my patients, “Where do you think you get vitamin D from? Where do you get vitamin D?” I say, “Well, it comes from the sun.” I know that the sun is sending down vitamin D into your body. Obviously, sunshine makes vitamin D in your body from some precursor. When I ask my patients what is that precursor, nobody seems to know. I tell them it’s this horrible thing called cholesterol, and their eyebrows go up.

Cholesterol is so drastically important for health, because (1) it’s the precursor for which we make vitamin D and (2) it’s a fundamental compound of every cell in our bodies and made by every cell in our bodies. It’s a brain antioxidant. It’s a precursor for all the steroid sex hormones – fundamentally important.

A research, which I reviewed, that’s interested in brain diseases has indicated that those elderly individuals with the lowest cholesterol have the highest risk for Alzheimer’s. They have the highest risk for dying. That’s an end point, isn’t it? Dying.

This war on cholesterol that we are convinced needs our support is so fundamentally inappropriate. I say to my audiences very frequently, “If cholesterol is so bad, what you’re saying is that if you believe in evolution or if you believe in creation – either way – either nature got it wrong or God got it wrong by putting the ability to make cholesterol in every one of our cells. Why would that be a mistake?” It’s not a mistake. We are desperate for cholesterol. It’s a fundamental player in every cell membrane.

Obviously, there’s something that goes on with cholesterol that we need to pay attention to: oxidation, the damage from free radicals to the carriers of cholesterol, the LDL. It isn’t the LDL
that’s the problem; it’s the oxidized, the glycated, the sugar-bonded LDL that is really the cornerstone of athrogenesis, the creation of the narrowing of the artery itself. Again, where do we go? We go back to a high-fat, low-carb diet as the way to keep our LDL or so-called bad cholesterol from becoming oxidized and creating problems.

We’ve been on a high-cholesterol diet for millions of years, and it has served us well. In fact, our genome has been selected based upon that diet, being on a high-cholesterol diet – eating eggs, animal fat, and animal protein.

**JM:** Well, I’m just wondering if we can go back on the question on astaxanthin and clinical improvement in Alzheimer’s, because as a practicing neurologist, you have a great opportunity to see that. I’m wondering if you’ve noticed any changes because this is sort of a leading adjunct and it’s really not even well-reported in the journals yet.

**DP:** It is not. As I mentioned, astaxanthin is looked at in macular degeneration. Let me get back to your question. We often use macular degeneration and other retinal issues as kind of a marker as to how things will respond to the brain, because the eye really is the representation of the brain. The same sorts of barriers present in the eye are present in the brain, you know. A lot of what goes on with macular degeneration really mimics the same sort of damage or stress from free radicals as we see in the brain.

And you’re quite correct. There aren’t a lot of studies that have looked at the role of astaxanthin in brain health. When we use astaxanthin, can I tell you necessarily that it is leading to the improvement that I’m seeing in my patients with neurologic problems, specifically dementia?

I can’t answer the question because I don’t use astaxanthin as a single variable. When I see patients day in and day out here in my clinic, they’re getting almost a ketogenic, very high-fat, low-carbohydrate diet, working these people into shape in terms of aerobic exercise, adding various other supplements, checking for homocysteine elevation and correcting that, correcting deficiencies of vitamin D, or going gluten-free. I don’t have astaxanthin as an independent variable that I can say this is the reason…

**JM:** Okay.

**DP:** That people are now able to balance their check book, drive a car, and remember a conversation, which is what happens to many of our patients when they adopt a program that allows them to regenerate their brain’s memory center. So, I’m not avoiding that question, but understand…

**JM:** Okay. You just don’t have the data to look at to answer.

**DP:** Right.

**JM:** Okay. It’s interesting you mentioned the ketogenic diet because I’ve interviewed Dr. Seyfried, who is a researcher at Boston University and connected with Harvard. He was one of the leading investigators – he’s a PhD – who adopted the ketogenic diet for a neurological condition, the treatment of seizures, and then from there spread to the use of that diet and treatment of cancer. And then there’s another PhD, Dr. D’Agostino in Florida, who’s also doing work in this area. It’s interesting that it all stemmed from the treatment of a neurological
condition initially, then stemmed on because they noticed their patients with cancer were doing better.

**DP:** [Inaudible 45:04] ketogenic diet invented. I love that.

**JM:** Yes.

**DP:** Apparently, at least in terms of seizures, it was 1921. But basically, humans have been in a modified ketotic state for as long as we’ve been on the planet, until quite recently. We’ve always functioned on a higher fat, almost no-carbohydrate diet. We’ve always been ketotic.

What Dr. Seyfried talked about in his new book and is lecturing about is a notion that we can treat cancer by using a ketogenic diet. I wrote in *Huffington Post* about the treatment of a very aggressive type of brain tumor called glioblastoma using actually his work, quoting his work, and then discussing how I’ve been using that in my practice along with mainstream approaches – chemotherapy, radiation, and surgery.

But understanding that when we target the cell’s mitochondria, the energy-producing parts of the cell, these mitochondria, yes they produce energy, but they also determine whether that cell will live or die. They control the gene expressions that regulate whether a cell will live or die.

When we foster the health of these energy-producing particles called mitochondria by giving them fat to burn, ketones to burn, specifically beta-hydroxybutyrate... I don’t mean to be too technical. But when these cells are burning fat and not burning sugar, it is better for them. They replicate. These cellular particles called mitochondria, they replicate. [Fat] provides cells what they need to survive.

What is really interesting, what Dr. Seyfried talks about in his book, is the fact that cancer cells do not have the ability to any significant degree to metabolize fat and are almost completely dependent on metabolizing sugar. Normal cells can metabolize fat; cancer cells cannot metabolize fat and only require sugar or thrive on sugar. Deprive them of sugar and you have the opportunity to allow normal cells to thrive while cancer cells will die. That’s called the Warburg effect.

It’s interesting when you ask or are dealing with a cancer patient, as I do here every day. They may come in to my office and they show me their PET scans. I ask them, “Do you understand what they gave you for this PET scan and what you give to get a PET scan to find cancer?”

**JM:** It’s glucose.

**DP:** It’s something called FDG. It stands for fluorodeoxyglucose. Basically, they’re getting a radioactive sugar, a radioactive glucose. What does it do? It goes right to the cancer cells that lights up, and that’s what you image. When you see a PET scan in a cancer patient that’s showing you where the tumor is, it’s lighting the tumor up because that tumor is sucking in the sugar that you administered.

I think that his book, Dr. Seyfried’s book, is so compelling, because what a powerful new tool it is in addition to all of our wonderful new approaches to cancer for mainstream medicine to
augment and to enhance the ability of our current treatments to work effectively. It’s a really exciting, groundbreaking information.

**JM:** I couldn’t agree more. It’s just shocking to me that the conventional clinicians or oncologists don’t appreciate or understand that. I mean, it lights up the scan. Get a clue! If it feeds the cancer, maybe we shouldn’t give it to them or restrict it.

**DP:** I’m not objecting to surgery, radiation, or chemotherapy.

**JM:** Well, I am, most of the time!

**DP:** Well, I know. I was about to qualify that. I’m raising my eyebrows, so the viewers know that they all... Do I think these modalities are overused?

**JM:** Absolutely.

**DP:** I really do think so. But leave that alone for just a minute. At least, I can retreat to this issue and say, okay, if you think that the weapons of war in both the First and Second World War is radiation and mustard gas derivatives are appropriate treatment for your cancer, that’s your decision, but at least give consideration to dietary issues as they relate to our most well-respected peer-reviewed science in terms of what it’s saying to us right now.

Beyond going ketogenic, recognize that the balance of organisms in your intestine play a critical role in maintaining immunity, and you sure as heck want your immune system to function when you’re fighting cancer and battling out your body to deal with cancer. When you damage your microbio, the balance of bacteria, in your gut by taking chemotherapy, at the very least add in an aggressive probiotic approach to keep bad bacteria count healthy, so that you may not get diarrhea.

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You may not be in a situation where you’re losing all your precious nutrients, for example, and compromising your body’s own ability to fight cancer and fight infection.

**JM:** Yes, those beneficial bacteria are absolutely crucial. I’m particularly fond of using fermented vegetables, because you can increase the amounts extraordinarily high. In fact, most people aren’t aware that in a healthy serving of sauerkraut – two to three ounces or so – you’re getting essentially 100 capsules of the highest-potency probiotic you could buy, and virtually almost free. You don’t have to pay for it.

If it’s fermented with a starter culture, which we’re actually going to be offering soon, you can actually get the vitamin K2, which is actually crucial to balance the vitamin D that you referred to earlier. Because high vitamin D without K2 is not a good combination for a long time, because it will definitely run into problems.

**DP:** Absolutely. Let’s talk about vitamin K2 for just a moment. I mean, being a neurologist, I deal with people with heart disease and stroke. Many of these people are coming in on Coumadin or Warfarin blood thinner. They say, “Oh, I can’t ever even eat the colorful vegetables and I sure as heck can’t take vitamin K2.” It’s a bit mystifying that they haven’t been clued in that K2 has
no real effect on blood clotting. It’s not going to change their Coumadin or Warfarin dosage. It’s vitally important for immune function, which is why you take it in the first place and which is what these people desperately need in addition to its role in bone health, etc.

When your culture is available, I hope I’ll get some of that. I’d love to…

**JM:** Hopefully, by the time this video airs, it’ll be available, I’m told. At this time, it’s about eight weeks away. We’ve been doing about two years of research and development on it to identify the strains. We’re still continuing to refine it. Because actually, any vitamin K2 supplement you purchase is actually produced by a bacteria. That’s extracted from bacteria. It’s a bacterial fermentation byproduct. You can get it essentially for free with the fermented vegetables.

**DP:** I often tell my patients we have a really fantastic local organic store. Everything in the store is organic. They bring in the vegetables locally from the farm here. These vegetables are dirty; they come out of organic soil. The carrots have dirt on them. As strange as it may seem, I tell my patients to eat them that way. I tell them, “Eat a little dirt.”

There’s this whole notion of this hygiene hypothesis that the elimination of dirtiness in our society is leading to autoimmunity, because we need to challenge our gut with those really healthful soil organisms. We’ve lived in symbiosis, as have all animals with bacteria, since we’ve been here. Our health is absolutely vitally dependent on alpha levels of those bacteria that outnumber our cells 10 to one.

Beyond that, the genetic material put off by these bacteria contained in our guts outnumbers our own genome a thousand times. We are, in a sense, far more bacterial than we are Dr. Mercola or Dr. Perlmutter. I think it’s really important for people to realize that we’ve got to care for our microbi, because that will control our health.

**JM:** Yes, indeed. As I mentioned earlier before we started, one of my new passion is this high-performance agriculture, understanding the soil microbiology, and doing things to optimize that, so that you can grow magnificent vegetables that are resistant to almost every pest and environmental challenge that they’re going to be exposed to. It’s a really exciting field and to be able to do that. It’s a phenomenal hobby. I hope to be spreading that information in the coming months and years. It integrates really well with health.

**DP:** When these vegetables become resistant to stress, they transfer that resistance to us. Because they have become hardened, they are resistant to infestation and they develop carotenoids, so they’re not damaged by ultraviolet light.

When we take that away from plants by artificially protecting them using pesticides – not only… Let’s get past pesticide residues for a moment, but recognize that we’re creating populations of plants and therefore foods that don’t contain within them all of these wonderful resistant types of chemicals that are transferrable to us. Things like resveratrol in stressed grapes. The content of resveratrol in a grape that’s got a little fungus on it or that was grown during a bad season that was stressful is much higher. Those plants that are grown naturally without pesticide assistance…

**JM:** Or synthetic fertilizers.
DP: That are living in a stressful environment are really the ones that are best for us, because we’re able to adopt those to our physiology. They lead to expression of our own genome. The foods, those plants that you’re talking about, change our genetic expression for healthier existence. That is really empowering information.

JM: Yes, indeed. Now, I want to get back to the ketogenic diet a bit. One of your statements earlier was that many humans were doing this for long periods of time prior to when it was developed clinically in the ‘20s. I believe one of the ways that they were achieving that status was they didn’t have access to a grocery store like virtually everyone watching this did. They couldn’t have food 24/7. I think having three meals a day is probably one of the worst prescriptions for health that anyone could ever advise, especially having breakfast.

DP: Yeah. Where did that three-meals-a-day thing come from? If you are critical of that three-meals-a-day, then you’re probably going to be critical of apple pie and frankly... I can’t think of anything else than apple pie.

JM: Occasionally, it’s okay.

DP: But I totally agree with you. As a hunter-gatherer, we might need to go a day or two or three without food. That type of stress is good for us. It turns on life-sustaining genes. If it weren’t for our ability to be able to fast and survive and the fact that fasting is good for the human brain, which is really one of the keys to our existence, you’re right, a 100 percent right: we wouldn’t be here.

In my new book, Grain Brain, we actually incorporated fasting, a one-day fast as a way of jumpstarting people in terms of health and physiology to really sort of push the reset button. It’s really a good thing for people to do.

JM: Yeah, I couldn’t agree more. It’s been radically transforming for me personally and for so many of my friends who adopted it. I mean, they just can’t say enough good things.

One of the most remarkable side effects, I’m sure you see this yourself, is that once you’ve shifted from the ability to burn carbohydrate as your primary fuel to fat, which takes a while... It doesn’t happen in a day or two; it usually takes a few weeks. But once that shift occurs, this desire, this craving, for the carbohydrate just disappears. It is gone. I am sitting here now, talking to you and the last food I ate was 18 hours ago. I have no cravings at all. I’m not hungry. It’s just fascinating.

DP: Well, you know what, my last meal was dinner last night. I haven’t had a breakfast. The fact that you miss breakfast... I mean, don’t expect your teacher is going to [inaudible 58:15] with a ruler. This doesn’t have to be the most important meal of the day.

JM: Right.

DP: I don’t know where these things come from. But when we start telling people that it’s good to miss a meal or two or three, people are kind of down on, but they’re not up on. It’s traditional. I mean, we have missed meals since we’ve been here as hunter-gatherer legacy.
But even these days, we’ve talked about it in the ketogenic diet. The easiest way to become ketotic is just to stop eating. Because if you go through your sugar stores and then your glycogen stores relatively soon, you begin to burn fat, the most incredibly powerful source of fuel for human physiology and especially for the brain.

We all learn – I’m sure you learned – in medical school that the brain loves glucose. The bottomline is the brain doesn’t love anything. It turns out that the best fuel for the brain, the super fuel for the brain, according to Dr. George Cahill who’s written on ketosis, is ketones. It’s fat that we mobilize when we’ve been able to get rid of the carbohydrate and introduce coconut oil and other sources of fat into the diet.

You bring up an extremely important point. Because people are going to adopt this diet, they will be a little bit wobbly at first. But ultimately, you know, the body is like a flex fuel car. It will be able to shift over to start to burn fat as most of the carbohydrates and love it.

You get, as opposed to pouring gasoline on a fire when you get a sudden surge of energy like you get with carbohydrate, an oil lamp that burns a constant flame 24/7. Whereby 10:00 in the morning if you’ve eaten pancakes, rice, or anything, you’re on your high. At 10:00 in the morning, you’re reaching either for coffee or some kind of snack, a mid-morning snack, because your sugar levels went up, your insulin levels went up. Now you’re on the skid, and your body is saying, “We’re in trouble.”

[----- 1:00:00 -----]

Whereas if your body has adapted to burning fat, you’ve got constant energy day in and day out. If something’s going on at 11:00 at night and you need to focus your mind, it works. It’s really important that people recognize that it’s going to take a little while to get your body back to where it wants to be, it needs to be, and where traditionally our physiology set point has been for a couple of million years.

**JM:** Yes, indeed. Well, we’ve kind of diverged away from one of the primary basics of your new book, the *Grain Brain*, which is essentially the restriction of gluten and casein, or wheat and dairy for the most part. But in some ways, that’s so fundamental. If you’ve been studying natural medicine, you know that’s the basics. We’ve kind of diverged into this newer, more exciting radically transforming component of your therapy, which is what we’ve been discussing.

I think that’s great that we both sort of came to the same conclusion. This is relatively recent for me. I haven’t always had this understanding or appreciation. It’s only been a year or two. But once you get it and you apply it, it’s just a life-transforming event.

**DP:** Like yourself, over the years, I have weighed this level of science and that mindset, “What is best for me? What is best for my patients?” What is really so empowering is to recognize that while it was really cool to look at all the science over the years about what people were doing, where we are now is supported not only by the science, but by our legacy. It comes back to Paleo nutrition. What have we been eating? Therefore, how is our genome been selected based upon the foods that we eat?
That argument really is empowering. I mean, that’s part of the argument that really strengthens the case that sugar and blood sugar are so… As a matter of fact, it is a cornerstone of my new book, *Grain Brain*. It’s about wheat and it’s about carbohydrate.

One study came out. Let’s look at this slide. This slide is really interesting. This actually shows the function of the brain’s so-called Alzheimer’s area, those areas of the brain that degenerate with Alzheimer’s in relation to blood sugar, showing that the higher blood sugar levels actually, first of all, compromise the function in those areas of the brain that are first to go with Alzheimer’s. This connection, a simple connection, is so profound between your choice of where you’re going to keep your blood sugar and your risk of brain degeneration and becoming one of those incurable Alzheimer’s patients. This is so fundamentally important.

As I see these patients in my office, they are brought by their family members. The challenging part for me is after the appointment when the family member say, “You know, Doc, I don’t want to end up like mom and dad. What can I do?” And I explain all of these things in a preventive way. I have to say that usually, they’ll say, “You know, Doc, you just don’t know what it’s like to have a mom and dad in this situation.”

I am always deeply challenged at that point, because, as a matter of fact, I do know what it’s like. My father was a brilliant Lahey Clinic-trained neurosurgeon. Now he lives across the street from my medical office in an assisted living facility. Each morning when I go to see him, he asks me, when is he going to be making rounds on his patients? He’s dressed and ready to make rounds on his patients. He retired 30 years ago. He still doesn’t get that because of his Alzheimer’s disease. The point is that I do get it. Believe me, I get it.

I think that, again, the message is one of empowering with information, with knowledge. The knowledge here is fundamental and is supported by current science. It’s actually very, very simple. We have to reduce inflammation. We have to reduce free radical-mediated stress or the action of free radicals. We do that by our nutritional choices. It’s what you’ve been talking about now globally for years, and I applaud you for it.

These changes that people can make in their diets are not draconian. The only thing that makes it difficult is because of what we are told by society we should be eating. Those statements are not given to us with good, sound scientific backing. Again, these are simple but profound choices that people can make.

**JM:** Well, I want to thank you so much for all your marvelous work and for really providing a model for so many others, especially neurologists, to follow in applying these important principles. If someone is interested in obtaining more information about your clinic or your book, what are the best resources you could recommend?

**DP:** Well, the book is *Grain Brain*. My website – we update our website every single day with information – is DrPerlmutter.com.

**JM:** Okay. Are there any other resources that people might want to access to learn about what you’re doing? Or any places on your site for more information?

**DP:** I post on Facebook every day with links to current studies. That’s David Perlmutter, M.D. On our Facebook site and on the homepage as well is a list of my upcoming conferences. I
lecture, as you know, around the country to professionals and also to the general population. Everybody’s welcome.

People can contact me on Facebook and ask questions. I’m delighted to respond. I answer those, at least until now I’m able to do it. I hope to be able to continue. I answer everything personally and generally provide a link to whatever link that I use to substantiate my answers.

But again, I want to thank you for the opportunity to talk with you today and really get this message out, because again, I think it’s so fundamentally important.

**JM:** I couldn’t agree more. It’s a very important message. The more people will apply it, the less the disease and illness will be and the higher the quality of life. I mean, the prevention is so much easier than treatment. There’s just no question about it. Even though there is this element of neuroplasticity, it’s far better to prevent the problem to begin with.

**DP:** Well, Doc, I’m pretty sure that the time to fix the roof is when the sun is shining. That’s the segment of the population I really want to target – people who have not yet had cognitive issues but are at risk, which is basically all of us. In fact, this is the time to make the changes – while you’re still healthy. Time to cut back on the carbohydrates, increase your consumption of good fats, get out and exercise, 20 minutes of aerobics every day – these are the fundamentals that could keep these problems from happening in the first place.

**JM:** Terrific. Well, thank you for joining us.

**DP:** It’s my pleasure.

[END]