Brain Maker: A Special Interview with Dr. David Perlmutter

By Dr. Joseph Mercola

DM: Joseph Mercola

DP: David Perlmutter

DM: Who would have known that the quality of the bacteria in your gut has enormous influence on your brain? Hi, this is Dr. Mercola, helping you take control of your health. Today I'm joined by one of my good friends, Dr. David Perlmutter, who is here to talk to us about that topic, which is explored in great detail in his new book, Brain Maker: The Power of Gut Microbes to Heal and Protect Your Brain-for Life. Welcome and thank you for joining us.

DP: It's always a pleasure. We always have a really great conversation.

DM: We sure do. I neglected to mention – just to provide some more information about you that our listeners and viewers may not be aware – you're a board-certified neurologist, a fellow of the American College of Nutrition (ACN) (actually I was able to get into that, too, thanks to your assistance), and [have] lots of awards. Last time you were not only a New York Times bestseller, but the number one bestseller for a number of weeks with your previous book called Grain Brain.

I'm sure that you're going to see equal success because you are really a mover and a shaker. You're getting phenomenal exposure in the media. You're really one of the primary movers of this information, which is really contrasting to the traditional model, that provides this natural approach. And the public needs this so badly. I'm just so glad you're a really good advocate for it.

DP: I appreciate that. My roots are, in the beginning, in the field of neurology. That's what I did. I practiced traditional neurology from the get-go. What became so frustrating to me was neurology is a field... I don't mean to be too derogatory, but you know, sometimes you have to light the candle, but other times maybe curse the darkness just a little bit. It's really a field of diagnose and then adios, meaning we make a diagnosis, we name something, whether it's Alzheimer's or Parkinson's, and then pretty much that's the best you can do.

We don't have treatments for the underlying conditions – for Alzheimer's and for Parkinson's. Yes, the symptoms of Parkinson's can be treated. The symptoms of a headache, for example, can be treated with pain medication much as the same way. But we're now recognizing from research at our most well-respected institutions from around the globe that (as you mentioned, who knew) the gut bacteria are wielding this very, very powerful sword of Damocles, determining whether we're going to have a
healthy brain or not, whether our brain is going to function well or not, and whether our brain is going to become deceased or not? Who knew that we’d be referring back to the gut?

It turns out that this notion of what is called reductionism, where the body is reduced to its individual parts. The brain is in Cleveland and the gut is, who knows where, down in Florida. It is really kind of a very silly notion. Every system in the body interrelates in a way that ultimately, hopefully, will cause the manifestation of what we call health and disease resistance. And that said, it’s humbling. It’s humbling to think that we’re able to have this conversation right now because of the fact that we’ve got healthy bacteria in our gut that are sending good signals to our brains and allowing us to function.

DM: Yeah, that seems to be one of the primary mechanisms of action of how a healthy diet works. It upregulates, modifies, and improves the quality of the gut microbiome.

DP: Exactly. These bacteria, these hundred trillion bacteria that live within the gut are so intimately involved in the brain at a number of levels. They manufacture neurochemicals, for example. Things like dopamine and serotonin. They manufacture important vitamins that are important to keep the brain healthy. They also maintain the integrity of the lining of the gut.

And why that is germane for our brain discussion is because when the gut lining is not maintained, we have permeability or leakiness of the gut because the bacteria are imbalanced. That increases inflammation. Why are we having a discussion about inflammation? Basically because it’s the cornerstone of everything bad that can go wrong in your brain like Alzheimer’s, multiple sclerosis (MS), Parkinson’s, and autism.

We’ve got to really deal with it on a preventive basis, understanding what it is going on in our society, in our Western culture, especially from a dietary perspective, that is threatening the health of our commensals. We call these bacteria “commensals,” because they share the table with us. We eat together with the bacteria. Basically, they eat what we eat. Our food choices have a dramatic effect on the health viability and even the diversity of those gut bacteria.

It matters a whole heck of a lot to the well-being of the brain. It’s every degenerative condition that you can think of. There is actually a fingerprint of the gut bacteria, a characterization that goes along with type 2 diabetes, changes in the gut bacteria that may actually not be because of the diabetes, but may actually have a role in causing the diabetes itself.

Let me tell you an interesting study that came out. There’s a researcher in Amsterdam, Dr. Max Nieuwdorp. He’s really published a lot of the work looking at the changes in the microbiome, in the gut bacteria that is characteristic of type 2 diabetes. He took over 250 type 2 diabetics and did a procedure called fecal transplantation. He actually transplanted the gut bacteria via feces from a healthy, lean person into the diabetics and basically reversed diabetes in more than 250 individuals.

That’s astounding. This was not medication with a side effect. He changed the makeup of the gut bacteria, and the diabetes situation went away. This is a new world that we’re
talking about. I heard him lecture at Harvard along with the other top microbiome researchers. In fact, Dr. Nieuwdorp has agreed to be one of our guest speakers. We have a microbiome conference coming up in a few months down, in your neck of the woods, in Hollywood.

**DM:** Hollywood, Florida. Maybe you can talk a little bit more about that now. You’ve really embraced this full force. You actually helped develop a journal that discusses this in great detail, a peer-reviewed scientific journal. I don’t have no know if it’s indexed in the next *Medicus* yet. And you’re having a conference, an annual conference with the leading researchers in the world. This is not something you know anecdotally or superficially. I mean, you’re really embracing and studying this in a very deep level, and communicating with some of the leading researches in the world.

**DP:** Well, truly. I’m at a stage of my life that those years of anecdotes start to add up to what we call data.

**DM:** Right.

**DP:** But beyond that, you’re right. This is where the current science is. It’s definitely the future. The Human Genome Project (HGP), we began thinking 15 years ago that we would be able to leverage this information about the human genome in very powerful ways to bring about cures and treatments for various diseases. That didn’t pan out. By and large, the genome, the human genome is still looked upon as being fairly static, meaning unchanging, although we know that food choices influence gene expression. But the gut microbiome, that’s 99 percent of the DNA in your body. That is highly responsive and changeable based upon lifestyle choices, most importantly our food choices.

For me, being a brain specialist dealing with brain disorders, my whole professional career, I’ve been stymied by not having really powerful tools to implement and to bring about changes in individuals who have these issues. Now we’re beginning to get those tools, and they are in the gut. Who knew? I mean, I can assure you that in neurology school, we didn’t study the makeup of the gut bacteria and how that would ever influence the brain, and yet, this is leading-edge science.

This is what our most well-respected researchers and peer-reviewed journals are talking about: not only are the gut bacteria fundamentally involved in brain health, but you can change the gut bacteria by interventions – taking probiotics and choosing to eat foods that are rich in prebiotics and to enhance the growth of good bacteria – and even more aggressive therapies that perhaps we’ll talk about later.

**DM:** Yeah. I think the key to emphasize here is to not give people the false impression that they need a fecal transplant. Because that is really in many ways, even though it’s addressing the causes, addressing it in a symptomatic Band-Aid way, because it’s not changing what caused those bacteria to go rogue to begin with.

**DP:** Good point.
DM: Yeah. These other changes are really a crucial part of the equation if you’re going to get permanent change.

DP: Without a doubt. Just as a disclaimer, that’s not what you and I are talking about today.

DM: Right.

DP: We’re not telling people, “Hey, you’ve got type 2 diabetes, autism, or multiple sclerosis, you should go ahead and do a fecal transplant in your neighborhood.” That’s clearly not what we’re talking about. There’s no recommendation here. Although I will say that in *Brain Maker*, I do present cases like that: individuals who went away or decided other ways of accomplishing that task and have actually remarkable improvements.

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But you bring up a very good point to take a step back and ask ourselves, “How the heck did we get here in the first place? What are we doing in terms of our lifestyle choices today that are messing up our gut bacteria?” We know that, for example, when you look at gut bacteria in world populations, in less-advanced populations even today… One study came out looking at the gut microbiome in Burkina Faso, which is in Africa, and looked at a couple of things:

1) The amount of what are called short-chained fatty acids that the bacteria produce, which was a lot higher. We need those short-chain fatty acids.

2) But more importantly, the diversity of organisms. The multitude of different species that they found in contrast to what is found in the Western cultures, which is far less diverse.

And even more intriguing are studies that are coming out now that are able to determine the human microbiome from as long as 5,000 years ago, looking at fossilized fecal material called coprolites, doing DNA analysis, and revealing that in fact the cosmopolitan microbiome that we have now is unlike anything humans have ever had.

Now, when you recognize that this gut microbiome is 99 percent of our DNA, we realize there has been very little change in that DNA, at least for the past 5,000 to 6,000 years. Now it’s dramatically, dramatically changed and is creating gut bacteria that increase inflammation. That increased the harvest of calories from the food that we eat associated with increased body fat and obesity. That changed the way we respond to insulin and glucose, changing a lot of our metabolism, and increasing inflammation. Again, that leads to everything bad that you don’t want to happen – from heart disease to diabetes, cancer, Alzheimer’s, Parkinson’s, MS, and the list goes on.

Rebuilding the gut bacteria, that’s the key. But even to take a step back, how do you preserve it in the first place?
DM: I just want to comment on the potential reasons why some of this information is coming to the forefront now. I think you alluded to it, and that is the technical ability to do this analysis, the DNA analysis and the sequencing, which really didn’t exist that long ago. I mean, it did in some ways, but it was very quasi. Because you can’t do a stool culture and expect to identify all these thousands of different species. It’s just not technically possible.

DP: That’s right.

DM: When they do this analysis, it’s with DNA sequencing. That’s why we’re starting to see this explosion of data that you referenced to.

DP: Unbelievable. It’s not expensive. As you say, both, what’s called high-throughput DNA sequencing and another technique called 16S ribosomal RNA (rRNA) analysis. You can’t really culture these bacteria. We’re just beginning to get this incredible data that indicates that the microbiome, 99 percent of the DNA that we have within us, in Western cultures and particularly here in America is unlike anything that humans have ever experienced, and it wields, as I mentioned earlier, a very powerful sword in terms of our health.

DM: Can you comment on some of those? I’m not aware of that or of reading that before: that there’s this dramatic difference from ancestral microbiome populations and maybe what the implications of that are.

DP: Well again, there’s this beautiful dance that happens between the gut bacteria and our own DNA. The gut bacteria actually influenced the expression of our 23,000 genes. Think about that. The bugs that live within us are changing our genome expression moment to moment. Our genome has been very static, has not changed over thousands and thousands of years. Suddenly, now, because we’re changing our gut bacteria, we are changing the signals that are going to our own DNA, coding now for increasing things like free radicals, oxidative stress, and inflammation. That is a powerful player in terms of so many disease processes.

On one hand, that’s kind of a scary business. But on the other hand, let’s put a positive spin on that, and indicate that this glass is half full. Because we now understand that by paying attention to the microbiome – by reducing our consumption of antibiotics every time we have a sniffle, by being judicious in terms of the foods that we eat, by choosing to eat organic foods and choosing non-genetically modified (GM) foods, for example, and by choosing to have our children through natural child birth as opposed to depriving them of obtaining their microbiome by passing through the birth canal.

These are all very relevant lifestyle choices that we can make to enhance the health and the diversity of the gut bacteria. That’s going to give us a lifelong advantage in terms of being resistant to the very diseases that we dread the most.

DM: Yeah, it’s a really important point. This epigenetic shifting, which just has a profound influence on our health issues.
DP: You and I have talked about epigenetics for the past couple of years. We’ve talked about it in terms of our food choices and vitamin supplementation or not having a role to play in modifying what we call methylation pathways or changes in regulatory switches in the DNA, which has been very interesting. But now the idea is that our gut bacteria are doing that all the time as well… They’re trying to create Joseph Mercola to be as healthy as possible because you’re their meal ticket. You’re keeping them going. They’re doing everything they can to keep you healthy.

That’s why we have to return that favor. The true definition of symbiosis: we’re supporting their health and they are supporting our health as well. We do that by the foods that we eat. They are, as I said, commensals. We’re sharing this meal. We treat them right by eating, like you’ve talked about for the past couple of years, fermented foods that are rich in probiotic bacteria and prebiotic foods that contain prebiotic types of fiber like inulin and fructooligosaccharides (FOS). Acacia gum has become very popular.

These are nutrients that enhance the growth of good bacteria with multitudes of studies indicating things like weight loss, a better control of blood sugar, and reduction of inflammation just by using these products. One study came out just last month, showing how children with allergic rhinitis and breathing issues have improvements by just giving them fiber, not even giving them probiotics, just giving them prebiotic foods to enhance the growth of healthy bacteria. Hey, I’m the first to admit where at the very early stages of our understanding. But finally, finally we get this. We realize that we are not alone.

DM: Yes, absolutely.

DP: We’re colonized by this vast array of organisms that are modulating every aspect of our health and physiology moment to moment, and we can keep them happy.

DM: Yeah, and we can modify, as you said, by these prebiotics. But ideally, that’s one of the ways that a healthy diet works. It’s because it’s full of raw, fresh organic vegetables that have fibers in them that serve as magnificent prebiotics and feed these gut microbes.

DP: And we’re not inventing something new here. We’re not reinventing the wheel. This is how humans have eaten for a couple of million years. It is only in the past, maybe hundred years that suddenly food became sanitized, and we were told, “Eat this processed grains. Eat low fat. Use artificial sweeteners because sugar is bad,” and look at what our health is like. Now, that last comment is not in favor of eating sugar by any means. So many people opt for ditching the sugar-sweetened beverages because they’re drinking artificially-sweetened beverages which are associated…

DM: Even worse.

DP: With doubling your risk for diabetes. Doubling your risk for diabetes based on the number of cans of a sugar-free soda that you consume in a day. In a new study that just came out from the Israel, it’s been demonstrated that these changes happen in terms of diabetes risk and risk for obesity based upon guess what? The changing of the gut bacteria.
DM: The changing of the gut bacteria.

DP: Who knew? There’s a recurrent theme here.

DM: Right, absolutely. It’s just magnificent how these all ties in together. Now, one of the things you mentioned is the dangers of not having the right foods and unimproved gut microbiome is that you get this leaky gut, which you have mentioned, leads to inflammation. But it also leads to autoimmune diseases like MS and Lou Gehrig’s disease when it comes to neurological conditions, but certainly Crohn’s and inflammatory bowel disease. I’m wondering if you can comment on your experience with the autoimmune diseases and what types of improvements you’ve seen by changing the gut microbiome.

DP: Without a doubt. And again, who would have thunk it, you know? Who would’ve thought that I would be discussing with you multiple sclerosis, a brain-related disorder being involved in leakiness of the gut and also with all due respect, also leakiness of what is called the blood-brain barrier?

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DM: True.

DP: Many of the factors that affect permeability of the blood-brain barrier are similar to those that affect the gut. We’re able to measure the permeability of the gut lining by looking at a chemical called LPS. LPS means lipopolysaccharide. I don’t mean to get too technical, but it’s the covering over certain groups of bacteria in the gut. So simply stated: when you measure higher levels of antibodies against LPS in the bloodstream, it’s a marker of gut leakiness.

The other thing to know about LPS is it is in and of itself a powerful instigator of the inflammatory cascade. Higher levels of LPS in the blood dramatically increase inflammation throughout the body, not just in the gut, but everywhere in the body including the brain. When you read the research about LPS, you see that there are dramatically elevated levels of LPS correlated with things like Alzheimer’s disease. A leaky gut being part of Alzheimer’s, Parkinson’s, and you mentioned Lou Gehrig’s disease.

Now, it takes us out of the arena of looking at the brain. We see dramatically higher levels of LPS in Lou Gehrig’s disease. It correlates the level of LPS, a marker of gut leakiness, with the severity of that disease. We see it in diabetes. We see it also even in autism, higher levels of this marker of gut permeability. Now, does that mean it’s causing the problem? Oh no, you can never draw such a conclusion although I did, but that’s between you and me. I think it’s quite clear.

Look, these are all inflammatory disorders, and this LPS is a powerful marker of inflammation and ab instigator of inflammation. We’re never supposed to say, “Well, correlation means causation.” I believe it. That said, what have we done in the clinic? We restore gut health and watch what happens. In fact, in Brain Maker, I present pretty aggressive treatments for maintaining and restoring gut health using a variety of
techniques – from using what are called probiotic enemas to even going as far as having people get what are called fecal transplantation. We talked about it earlier. And do we see success? We sure do.

I have a case history in Brain Maker of a young man with MS who couldn’t walk without two canes and who underwent a series of fecal transplantations in Europe, and came back and walks without any assistance whatsoever. His videotape is linked to the book and is on our site. I use the video of this man walking when I do lectures to physicians. They look at this with their jaws hanging, because again, for you and me, this was never even a consideration in medical school.

The gut was something that was full of terrible things, which could contaminate your surgical field, that you just paid no attention to. If you did pay any attention to the gut, why, you’d become a gastroenterologist, otherwise there’d be no interest in looking at it. But it turns out that it’s relevant whether you’re a gastroenterologist, a neurologist, a psychiatrist, a joint specialist, a skin specialist, or even a cancer specialist. We’ve got to pay attention to nurturing these bacteria if we’re going to keep people healthy.

DM: Absolutely. Can you comment on the type of criteria the centers that are doing these fecal transplants have with respect to identification of an appropriate donor?

DP: That’s an excellent question. It’s not like you’re just going to find somebody on the street, get his or her fecal material, and then use it in the fecal transplant. I had the opportunity to visit a company at Massachusetts Institute of Technology (MIT) called OpenBiome. They are a not-for-profit that is collecting fecal material for this type of procedure. They’re supplying these microbiome fecal transplants to over 150 hospitals here in America. They screen their donors for communicable diseases, as you mentioned.

DM: Sure.

DP: Things like HIV and hepatitis, and also screen the stool to make sure that there are no pathogenic or bad parasites, for example. Because this fecal transplant idea has really taken off mostly to treat a particular gut infection that causes diarrhea, which goes by the name C. difficile or Clostridium difficile infection, which has become more and more rampant in our population because it’s a consequence of an imbalanced gut bacteria brought on by antibiotic exposure.

Traditionally, the treatment of C. diff was by giving an antibiotic called vancomycin, which is about 26 to 28 percent effective. Fecal transplantation’s at least 94 percent effective – completely and in one treatment eradicating that issue.

What we do understand now is that there is evidence of a disturbance of the gut bacteria even in things like autism. There was an incredible report that just came out. Oddly enough, Scientific American is talking about that. It makes sense to at least consider that. Our patients are not the first to have had this treatment. It’s been done before. As you and I have this conversation, they have just finished recruiting patients at the University of Arizona to actually participate in this study, treating autism with fecal transplantation.
But you know, your viewers of our interview today I think would be more interested in knowing, “Okay, I’m not going to have fecal transplantation,” as you’ve mentioned, “but what can I do right now to rehab my gut bacteria?” That’s [what] we’re bringing back to the table.

For example, fermented foods, sauerkraut, and kimchi. Making your own at home. It’s very straightforward. I mean, kimchi has been made for a couple of thousand years. It creates good bacteria right in your own home, in your own bowl. Put it in the refrigerator. Drinks like kombucha, for example, is rich in probiotics. And bringing back to the table the fiber-rich prebiotic foods like jicama (which is Mexican yam), Jerusalem artichoke, garlic, and dandelion greens. Wonderful rich source of prebiotics to nurture those gut bacteria.

Then again, [it's] very important to understand that while you may not be taking antibiotics every year for the cold that you get, understand that here in America, 75 percent of the antibiotics that are produced go into the creation of the food that we eat. The cattle that is raised for the meat that we consume are OD’d (overdosed) on antibiotics, and that changes their microbiome. It affects the food that we eat and also paves the way for the development of what are called resistant organisms. We’ve got to stop that nonsense now. We’ve got to understand, for example, that spraying our food with herbicides, which change the human microbiome, is a clear and present danger.

DM: Absolutely. I want to put in a plug for fermented foods. I’ve known about them for quite some time now so much so that I was inspired about three or four years ago to do the research to create a Starter Culture, so that when you ferment your foods, you can… Before I mention this, it’s easy to ferment foods. You can do wild fermentation. It takes about three weeks and you’re not quite sure what type of bacterial strain you’ll have in there. But if you do it with the Starter Culture, you can speed it up to about a week.

I said, “Listen, one of the most important nutrients is vitamin K2, not K1 but K2.” It works synergistically with vitamin D and most of us are deficient in it. Its primary source is fermented foods, so I said, “Let’s optimize the culture strains to produce more vitamin K2.” Because it pretty much is in all fermented foods but in may be really small sub-therapeutic doses.

DP: That’s right. And that will help you lose weight and regulate your blood sugar for crying out loud.

DM: Yeah. When you make it yourself, too, you could also customize the blends.

DP: Yeah, sure.

DM: So it tastes the way you want it. It’s not something you abhor, say, hold our nose, and swallow it down. It’s something you actually enjoy doing.

DP: Kimchi is over the top fantastic. Kombucha is… These are wonderful foods. I put recipes in the book, so people can get started on doing this. Again, let’s take a step back here. I just mentioned probiotics and mood, and that may well seem like a stretch
as well. It turns out that, as I mentioned earlier, the probiotics produce the very neurochemicals that regulate your mood – things like dopamine and serotonin.

Dr. Emeran Mayer at University of California, Los Angeles (UCLA) did a very interesting study and published it the journal *Gastroenterology*. He took 36 women and divided them up: one group received a fermented milk product rich in probiotics, one group received milk, and one group received a placebo (liquid food). They did a test on them at the beginning called functional magnetic resonance imaging (MRI).

They looked at their brains, and challenged these individuals by showing them a picture that was sort of threatening, of a person’s face that was challenging. They repeated this four weeks later when they were given the fermented product or not. Those individuals who had consumed the probiotic-rich fermented product had a dramatically reduced reaction to being threatened by these pictures, meaning that their perception of the world, how they saw their environment, and how they responded to their environment was changed by simply the consumption of probiotics.

Can you imagine that the bacteria within your gut correlate with your mood, and correlate with things like depression and anxiety? We now understand that depression is at its core an inflammatory disorder. That markers of inflammation are dramatically elevated in correlation with depression. I mentioned earlier about lipopolysaccharide or LPS, just like in Alzheimer’s, with major depressive disorder, the level of LPS, a marker of gut leakiness and inflammation, is dramatically increased correlating with major depressive disorder. It's inflammatory.

**DM:** Is this a clinical tool that you can actually access and measure regularly to monitor the progress of your patients?

**DP:** We do it every day. There’s a laboratory called Cyrex, and it’s the number two panel. Oddly enough, how would it be the number two if it correlates quite nicely? But that said, interestingly enough, what are called SSRIs or antidepressants – the selective serotonin reuptake inhibitors that people are quite familiar with, the Paxil’s Prozac, Zoloft, etc. – are actually fairly potent anti-inflammatories. Their action in terms of reducing inflammation may have little to do with their effects upon serotonin, but may actually be acting through a mechanism of inflammation reduction. Who knew?

We all know that when we’re ill, when we have a cold, we feel crappy not only because we have the cold, but our mood is changed because of the overabundance in our bodies of these inflammatory chemicals that happens when we’re sick. So, everybody, when you’re sick, you’re depressed. It may well have to do with the fact that LPS is elevated, inflammation is elevated, and it affects the brain.

**DM:** Sure. Now, you’ve given us terrific recommendation on how to rehabilitate our gut health and decrease this leakiness to decrease inflammation and autoimmune diseases. But you’ve got six essential keys on how to rehab our gut, and I’m wondering if you can go over some of the ones you discussed in your book.

**DP:** Well, let’s start at the beginning and where you get your microbiome to start with. You get that microbiome by passing through the birth canal. There’s this beautiful
process whereby bacteria in the birth canal are optimized, so that when the baby passes through the birth canal, he or she is covered with bacteria from the mother. Those bacteria prime the immune system, prime the ability of that infant to then digest milk, mother’s milk, for example.

Step 1: Do everything you can to avoid a Caesarian section. I want to be really clear that I’m not mommy-bashing here, because C-sections are important. They save lives. They save lives of the mother and the baby. It’s a wonderful technology that we have that can make that happen.

DM: And sometimes you don’t have a choice.

DP: True. It’s a wonderful procedure. But that said, the notion that 33 percent of births in America are by C-section today – one-third of all births are by C-section – begs the question, “Are one-third of pregnancies complicated and require that procedure? Why is it increasing?” I don’t think pregnancy is increasing in its complexity or its risk. With all due respect, some of them are done out of convenience. I want mothers and fathers who weigh in on the decision to understand that it’s far more important than just how big that scar is going to be.

When you elect to deliver a child via Caesarian section – and again there are times when you need to do that – understand that by and large, you’re tripling the risk for attention-deficit hyperactivity disorder (ADHD) in your child. You’re doubling the risk for autism. You’re dramatically increasing the risk that that child will have obesity, be obese as an adult, develop type 1 diabetes, suffer ADHD, as I mentioned, or allergies. These are immune issues. They are inflammatory issues that are dramatically increased in children born via Caesarian section.

My vote would be, and as I described in Brain Maker, researchers at Yale University have developed the technique whereby a gauze sponge is placed in the birth canal prior to birth before mother who’s going to have a C-section is given the IV antibiotics, which happens close to 100 percent of women in America now. Before those antibiotics go into her vein, that sponge is taken out of the birth canal, the baby is born, and then the sponge covers that baby’s face, inoculating that child with the right bacteria to be healthy.

DM: That’s pretty elegant.

DP: It’s simple.

DM: It seems simple and…

DP: Elegant.

DM: Not too costly.

DP: Not too costly. But can you imagine trying to get your hospital to do it? It was published in peer-reviewed literature.

DM: Just use an organic gauze.
DP: Yes, organic gauze. But it brings a new meaning to the term “gauze and effect.” You heard it first today. But that said, that was published by a well-respect academic researcher. I think we have to pay attention to that because those statistics that we have just went through in terms of risk for disease based upon being born C-section are very real. When your child is autistic, that becomes a challenge. It can perhaps be avoided if the child is born through the birth canal. Step one is how you are born.

Step two has to do with breastfeeding. We all live through the ‘60s and ‘70s when somehow we were told that now breastmilk was just as good as infant formula. I know that when our two children were born, we were given a bag leaving the hospital that had infant formula in it. Soya-based infant formula, I might add. We were told that for our children, “Hey, don’t worry, you don’t need to breastfeed. Science has taken care of that for you.”

It turns out that there is a lot that goes on in breastfeeding that transcends the chemistry, that deals with bacteria on the skin that is transferred to that new born, that deals with emotional issues that happen when that process of breastfeeding is occurring, and that deals with hormonal transfer based upon a mother breastfeeding. There’s a lot that goes on that pharmaceutical companies are never going to be able to put into a bottle. Now, that said, is there a time when you have to use infant formula? I guess there is. Again, that’s my disclaimer.

Next, and we touched upon this, is the incredible over usage of antibiotics in America today. When we treat people with an antibiotic every time they have a sniffle, a child pulls his or her earlobe, or has a sore throat, we’re really changing the microbiome, and we’re doing so dramatically.

Dr. Martin Blaser recently wrote a book called Missing Microbes. He’s really been at the forefront of this knowledge base indicating that when we change the microbiome, we favor certain groups of bacteria called, for example, the Firmicutes group, that when they are present in excess, increases the risk of becoming obese. Firmicutes bacteria tend to increase your extraction of calories from your food. What Dr. Blaser has called our attention to is the animal research that shows that when you change the microbiome using antibiotics, the laboratory animals gain weight. Why do you think we’re giving antibiotics to cattle? Because it makes them fat.

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The same thing is happening – I believe Dr. Martin Blaser is correct – happening to our children. If we pump them full of antibiotics, they get fat. Look what’s going on in America. That antibiotic argument I think really needs to extend to adults.

The peer-reviewed literature that is reviewed in Brain Maker challenges this outdated notion that, for example, if you have a hip prosthesis or knee prosthesis, every time you get teeth cleaned, for example, you’ve got to load up on antibiotics. It turns out that our most well-respected peer-reviewed literature doesn’t support that at all. That the risk for developing an infective joint, a knee replacement or a hip replacement is no less when you’ve taken an antibiotic than if you didn’t take it in the first place. Who knew?
And yet, when I talk to my patients about that, I ask them, “Do you take antibiotics frequently?” “Oh no, I never take antibiotics.” [I'll say,] “Well, don’t you have a hip prosthesis?” [They'll answer] “Oh, I do.” [I'll say,] “What about when you go to the dentist?” [They'll say] “Oh, yeah, forgot about that one.”

**DM:** It probably even increases it, because one of the primary contributors to your immune system function is the gut microbiome.

**DP:** And the microbiome in the mouth. Now, you’re changing the microbiome in the mouth and having your teeth cleaned. I don’t know what’s that going to do. But that said, I'm not telling people who have an artificial hip that they shouldn’t use antibiotics. What I’m saying though is that when you read *Brain Maker*, read the references. Take those references. They're all online. I have them on my website, www.DrPerlmutter.com. Print out the reference, our most well-respected literature that says, “You don’t need to be taking antibiotics when you go to the dentist according to the research.” This isn’t something that Joe Mercola or David Perlmutter have dreamed of. This is peer-reviewed science. Lord knows, you and I do dream of quite a few things these days.

**DM:** Sure.

**DP:** Those things have merit, too. The antibiotic story I think is very, very important. Another part of that story I guess we’re at point number four. It is that, yes, there is a clear and present danger in the notion of genetically modifying the food that we share with our gut bacteria. The gut bacteria are expecting the type of food that they have been provided for a couple of million years. Suddenly, we’re going to introduce foods that are genetically unlike anything the human microbiome has ever seen.

Well, obviously research is looking at that. Research is looking at how does GMO affect the human microbiome. If you believe that, you’d be wrong. The research that allows the Food and Drug Administration (FDA) to allow genetically modified food has not even considered looking at the role, the effects of GMO on the human microbiome. Never even been looked at. That's a scary thought.

Let me take it a little bit further if I may. One of the important reasons that food in America is genetically modified – and clearly, understand that in Europe, they laugh at us for eating genetically modified foods – is to allow the growing of crops to be what’s called Roundup-resistant, to allow crops to be grown so they can be treated with Roundup or glyphosate, the active ingredient, which destroys the weeds, but also tends to ripen the crops that it’s sprayed upon. Like here in Florida, where you and I live, our sugar crops are just painted with glyphosate, a very scary proposition. Because we do know the research is demonstrating that glyphosate does in fact change the microbiome. It changes bacteria.

**DM:** Well, that’s how it works. That’s why it works as a weed killer because it destroys the beneficial microbes and fungi in the plant’s roots that allow it to be resistant to disease. It does the same thing when they transfer to our gut.
DP: And we’re eating that. We’re eating that in America. We have no way of knowing it because there’s no labeling of foods.

DM: It’s probably more dangerous than the genetically modified food.

DP: Well, again we don’t know where we’re going with genetically modified food, but the glyphosate is a clear present danger. Globally, it’s being measured in the thousands of metric tons of this stuff applied to our food. Gregory Bateson, an anthropologist from Harvard University stated that, “Man is the only animal who will befoul his own nest, a sure sign of madness,” meaning, you don’t poop where you eat. You don’t contaminate yourself.

DM: Right.

DP: One of these days you got to wonder about that a little bit not only when we’re talking about the microbiome. We’re poisoning our food that we eat. If that’s not bad enough, that’s the food that we’re feeding our microbiome that basically are going to determine whether we live or die. It’s a bit of a worry.

DM: Actually we’re spraying about a billion pounds a year of glyphosate annually. Of which, the average person is consuming about 200 pounds of GMO foods loaded with this stuff.

DP: Yeah. If you’d like to say, “Well, okay, from this day on I’m going to decide not to eat GMO foods. When I go to the grocery store moving forward, based on what I’ve learned about genetically modified foods, I’m going to choose the ones that are labeled non-GMO.” But that does not make a lot of sense when you live in a place where there is no GMO labeling. But now we’re seeing it more and more.

DM: Which is the US.

DP: That is in most of our states, yes. I’d say what you can look for is the word “organic”, USDA-certified organic. I think that’s going to give you some measure of protection that the foods are not genetically modified. In a way, it does tend to encompass…

But buying organic foods is a good thing to do for a number of reasons, not the least of which you’re voting with your wallet. You’re telling the grocer that you prefer organic food. And the more people buy organic food, the more the grocers are going to stock them, the more their providers are going to have to grow those foods, so there will be a bigger and bigger trend towards organic, which is growing like the gluten-free trends have been growing. We’re seeing that. It’s a good thing because people are educating themselves and beginning to understand that food matters. Who knew?

What a notion, Dr. Mercola, that you and I are having a conversation about health and we’re talking about food, and we’re sort of outliers because we’re talking about food and human health. It’s a bit breathtaking.

DM: We’re used to it. Are there any more of your six [essential keys]?
DP: I don’t know how many we’ve gotten so far. But I’d say the next would be to focus on using probiotic foods, the fermented foods that you and I have talked about. I think there are some very reasonable probiotic supplements on the market that are becoming very, very powerful and have the ability to actually change the microbiome.

Finally, I think the notion of consuming prebiotic fiber. You know, all fiber isn’t prebiotic fiber. You can eat plenty of fiber. You can have your (the name brand you can choose whatever you like) psyllium fiber, for example, but it’s not much of a prebiotic though it’s a fiber. You have to seek out those fibers that are prebiotics.

Foods, for example, always the first to go to that are rich in prebiotic material like inulin, like I mentioned. Not insulin but inulin. Dandelion greens, for example, that you can lightly sauté. Mexican yam or jicama that you can chop up raw and put in your salad. When you’re consuming foods like that – or onions or leeks – you’re consuming foods that are nature has crafted to allow your gut bacteria to flourish. This is the key to health, disease resistance, and longevity well beyond the brain.

But again, from my perspective, when I deal with Alzheimer’s patients – and I deal with my father, an Alzheimer’s patient – you have to ask the question, “Why is it happening? Why are the rates of Alzheimer’s going through the roof?” It’s not just because we’re living longer, because now we’re probably not living longer for the first time in history, but it’s because this disease is taking hold. It’s an inflammatory disorder, as is published in our most well-respected neuroscience literature.

And the inflammation is coming from the gut. We’ve got to get our researchers out of the brain for a little while, where they have their comfort level, and start focusing on the gut because that’s where the answer is. Because we see studies now that are coming out showing that those countries, for example, where they have the highest degree of hygiene and where they have the least diversity of gut bacteria, have the highest incidence and prevalence of Alzheimer’s. Countries where there’s a lot of gut bacteria of different types and even parasites in the gut like Sudan and Kenya, they have very low incidence of Alzheimer’s disease, and it’s not because they’re dying younger.

[----- 50:00 -----]

Those parameters… Age has been adjusted for these studies. It’s not an age-related kind of thing that these people simply don’t live as long. We’ve got to understand that there’s what is called the “old friends” hypothesis, and what does it mean? It means that when we have in our guts what could’ve been bad bacteria or bad parasites, when we’re exposed to them early in life by playing in the dirt, we develop a tolerance for these individual forms of bacteria and parasites. In fact, they actually take up resins, and they help us. They provide balance in our metabolism, in our immunity, and in the production of inflammation and inflammatory mediators.

Our world in the Western culture is a sterile one. We’re bombarding our microbiome with foods that lack bacteria. The very bacteria that we have, we are compromising by our incredible over usage of antibiotics to treat viruses, which doesn’t make sense, as well as the antibiotics that go into our food, not to mention the hand sanitizers on the
end cap in every grocery store aisle. God forbid, we should have bugs on our hands. The message is let kids play in the dirt. Kids eat dirt, and there’s nothing wrong with that, provided the dirt is not contaminated by some industrial spill. We’ve always eaten dirt. We’ve always eaten food off the ground. As a matter of fact, at the end of the day, it turns out that’s probably good for us.

DM: Absolutely. Well, you have sent me a copy of your book, a preview copy, because as we’re filming this or recording this, it’s not out yet. But I haven’t had the chance to look at it because I was on my PBS tour, which you helped me coordinate, and thank you for that.

What I noticed clinically, and I’m just wondering if you can comment on your experience, is that you didn’t mention one important point, but maybe in your book. But the simple analogy here is that if you’re traveling down a highway in your car and you expect to stop, yes you would apply the brakes. But if you continue to keep your foot on the accelerator, you’re going to have a major problem stopping that car.

How that applies to the gut microbiome is that if you have a large amount of sugar of high-fructose corn syrup (HFCS), which is in the form that you’ve referenced earlier, typically also, is that you’re going to differentially increase the growth of the pathogenic disease-causing bacteria, fungi, and yeast. And unless you can…

In my experience, the stopping of the sugar is maybe the most important step of all the ones you mentioned, because it’s going to really impair the effectiveness of all these different strategies. I’m wondering what your experiences are.

DP: Well, in fact, there’s a whole chapter dedicated to it in *Brain Maker*. You’ve bring up a very, very good point. It’s not just the sugar, but more importantly it is the fructose, which does tend to favor what you call dysbiosis or the disparity in the array of bacteria. There’s also a very good correlation between fructose consumption and the levels of LPS, the inflammatory marker LPS that shows that the gut is leaking.

DM: Interesting. I wasn’t aware of that.

DP: Yeah, and it’s direct. We also know that another factor that leads to permeability or leakiness of the gut, oddly enough is what we called glycation of proteins, meaning high levels of sugar in the blood bind to proteins. There’s a correlation between the level of these glycated proteins, sugar-bound proteins, and further permeability of the leakiness of the gut.

We know that getting back to fructose, it’s a far more aggressive sugar in terms of glycating. That might explain why fructose consumption is related to increased gut permeability, why high fructose corn syrup, for example, may be a pivotal player in all of these inflammatory diseases like obesity. Obesity is an inflammatory situation. Fructose gets hit on the head at a number of levels.

We eat more when we eat fructose, high-fructose corn syrup, because it doesn’t cause insulin spikes. When you eat glucose or your body’s glucose levels go up, your body senses that. Your pancreas secretes insulin. It’s a signal to your brain, “Hey, push
yourself away from the table.” But when you’re consuming fructose like high-fructose corn syrup in soda or other beverages, for example, you don’t get that signal. You don’t know when to quit. Similarly, that signal is interrupted by artificial sweeteners. Again, you don’t know when you’ve eaten enough. It’s called satiety. Your satiety center is not stimulated. You don’t back away from the table, and you just keep going and going.

As you and I have a discussion about sugar and specifically about fructose, the answer here is not to opt for the artificially sweetened beverages and food because you’re going to get in worse trouble. Because things like aspartame directly traumatize your friends, your gut bacteria, and as I mentioned earlier, are associated with more than doubling the risk for diabetes, far more than drinking sugar-sweetened beverages.

DM: Terrific. We’re about to end the interview. I’m wondering if you have any simple recommendations or summaries that you’d like to present.

DP: I would. I’d say that again it’s a new era of understanding the powerful role of the gut bacteria in terms of our health, but it’s an empowering bit of information when we understand that we can make the choices like I’ve just outlined to enable recovery. We can, as Dr. Mercola talked about, take our foot off the gas, put it on the brake, stop the insanity of traumatizing these gut bacteria, and then rehabbing the gut bacteria. Because your brain can improve, your inflammation levels can go down, your heart will improve, you’ll lose weight and feel better, and that what it’s all about.

It’s all based upon treating these gut bacteria right through our food choices, through limiting trauma to the gut bacteria in the form of things like antibiotics, and even getting back to being breastfed or breastfeeding our children moving forward. There are some important points here. I think this is one of our best discussions yet.

DM: Yeah, I am certain. I haven’t, I said, read the book, but I’m certain that there are far more important points that go into greater detail with specific recommendations that you have in your book, which is why if you have an interest in this area (and I don’t know why you wouldn’t) and you’ve been intrigued with the discussion that Dr. Perlmutter and I have, it makes perfect sense to pick up a copy of *Brain Maker* which is on sale. Most likely it will be when we air this interview.

Definitely it would be to your benefit and the benefit of your family, because ultimately it’s going to be a magnificent tool to help you take control of your health. Okay, thanks for joining us.

[END]