Aristo Vojdani: How Environmental Factors Induce Autoimmune Disorders

SVHI Transcript, Transcribed by Bulletproof
Originally Recorded: 3/2015

File URL	https://www.youtube.com/watch?v=O-Quo8spvkY
Length	102 min (01:41)

Speaker 1: Anyway, I wanted to introduce Dr. Aristo Vojdani. He is a professor of neuroimmunology, the Carrick Institute for Graduate Studies; faculty member, Preventive Medicine, Loma Linda University; a faculty member, National University of Health Sciences at the Lincoln College of Professional, Graduate and Continuing Education. He is a past associate professor of Charles Drew/UCLA School of Medicine and Science. His research on environmental triggers in complex diseases resulted in the development of numerous antibody arrays for detection of many autoimmune disorders, of which I use many of those and I'm sure a lot of other clinicians here do also. He holds 15 U.S. patents for laboratory assessments.

He's published 160 scientific articles, which I find hard to believe because I read a lot of your things, so it seems like a lot more. He is the CEO and Technical Director of Immunosciences Lab. He is the Chief Scientific Advisor for Cyrex Labs, which I very much appreciate. He is on the editorial board of 6 scientific journals, and has received the Herbert J. Rinkel Award, the Linus Pauling, PhD Award, and the F.R. Carrick Research Institute Lifetime Achievement Award. This evening, he will be speaking on How Environmental Factors Induce Autoimmune Disorders. I'd like you all with me to give Dr. Vojdani a big hand and welcome.

Dr. Aristo Vojdani: Thank you very much for being here. I don't know where to start actually. After watching or listening to you guys; after what Dr. Husband introduced and that very lively discussion, I see how knowledgeable you guys are. I'm actually not new to the doctors from the Bay Area. Almost 25 years ago when I started my laboratory in the field of immunology, the first group of 25 physicians, MD, who joined using my laboratories were from the Bay Area. Thank you for being so knowledgeable and I'm actually learning from you guys. While I was sitting there, I was thinking, "Why am I here?" They know more than me probably about this subject." Anyway, please bear with me.

I'm going to share with you about 60, 65 slides. This is the shorter version of my talk, because I know it's better to go a little bit slow and make it as simple as possible because we are talking about very complex issues. With that, I would like to thank also my best friend, Dr. Dave Trevor and his wife, Kimmy, are here. I think some of you had the question and you wanted someone to talk about the children, definitely would like to extend invitation to Dr. Trevor to be one of our future speakers in here and talk about children more in detail.

Female: He can also talk a little bit tonight.

Dr. Aristo Vojdani: Yeah, well … Okay. What I'm talking actually applies to everybody, so thank you. Where will be the best place to stand as far as the camera? Am I covering the slides for you guys somehow?

Male: You're fine.

Male: [Inaudible 00:04:07].

Dr. Aristo Vojdani: Because I have to maybe … I don't know, in here. In here is okay?

Group: Yes. Yeah. Sure. Yeah.

Dr. Aristo Vojdani: Yes?

Male: Yes, perfect.

Dr. Aristo Vojdani: All right, so that way it's much easier. I'm going to share with you about the role of the environmental factors in autoimmune disorders. One of the slides that I'm going to share, which is actually is the summary of my talk, you have to be a good investigator, a good clinician, and sometimes a good patient to follow the orders of the clinicians when they detect some abnormalities. Today, I'm going to talk mainly about detect, remove, and repair. That's my message. Detect based on reliable methodologies.

If, for example, today you do food IgG testing in 10 different laboratories, you are going to get 10 different results. You as a clinician, what do you do? One laboratory is telling you no IgG antibodies detected; another laboratory is going to tell you 50 or 60 different items, 5 plus were detected. What do you do as a clinician? That's why my emphasis is on reliable methodology. I had my own share of laboratory testing few years ago. I used to do my own PSA. At my age, I have to do that. I used to get every year 2.1, 2.1, 2.2, 1.9, so it was okay. One year I get 7.5, and you know for a man, when you see you jump from 2.1 to 7.2, I think I have cancer. Guess what? I repeated that test in another laboratory, it was again 2.1.

That's the problem. That's why I'm saying that detect based on the correct and the right methodology. Choose the right laboratory. When you do that detection, which I'm going to talk about it completely today, there are some messages about remove the triggers. You have to remove the triggers. For those, for example, we're talking about, earlier there was a question about "I have an autoimmune disease." They put you on immune suppressant. Is that the solution? No, because they did not remove the triggers of autoimmune disease.

You'll hear the message actually if you detect autoimmunity or autoimmune, which I call it autoimmune reaction, you can do a lot to prevent progression of disease to autoimmune disease. Unfortunately, sometimes, when the damage is done already and the patient already lost functionality, the only thing you can do stop it, not to become worse than it is. Therefore, my message is early detection. Early detection for prevention of autoimmune disorders.

By the way, any slide that I'm presenting is based on science. This presentation is evidence-based, and if some of you at the end, you have a question, you want to challenge me, I love to be challenged, but always I'll have an answer for you based on science and articles which I read in scientific journal.

According to Autoimmune Disease Association, 53 million Americans are suffering from some type of autoimmune disorder such as Guillain-Barre syndrome, multiple sclerosis, and name it, many others. When you look at this also, picture, which I love, 10% of the world population suffers from autoimmune disorders. Unfortunately, the ratio between men versus women is sometimes 15:1, 10:1, 5:1. Only few of them are at the same level. I think if I look at the lady sitting here, no wonder we have more females in here than males. It's about autoimmune disease. I have special talk, which I don't have any slides of that in here, about why females get more autoimmune disease.

Female: [Inaudible 00:08:59].

Dr. Aristo Vojdani: Okay? [Crosstalk 00:09:04]. The healthcare cost for autoimmune disease is 120 billion. That's a lot of money. For cancer, it's 70 billion. When it comes to funding, it's completely disproportion. When you compare cancer to heart disease versus autoimmune disease, only $600 million. Therefore, we need more education. We need more funding. We need more people to do research in the field of autoimmunity. Unfortunately, we can find autoimmunity in children. I did a lot of work in children with autism, ADD, ADHD, OCD, PANDAS. Majority of them have neurologic antibodies, anti-myelin basic protein antibodies. Ten years ago, I published that in the Journal of Neuroimmunology.

Autoimmune disease can attack every single tissue in our body and these are just for examples. From skin, brain, internal organs, and that's my mother's hand. She passed away 12 years ago after 40 years of suffering osteoarthritis. I'll share with you what was the cause of her arthritis and osteoarthritis today.

Is it the gene or the environment? This is based on National Institute of Health, the Autoimmune Disease Coordinating Committee. They looked at identical twins versus non-identical twins. The identical twins, in average, if one of them had autoimmune disease during their lifetime, there was only 30% chance the second one to get autoimmune disease while in 9 identical twins and control is about 5%, for example. The conclusion in here based on National Institutes of Health Autoimmune Disease Committee, 70% is the environment, 30% is the gene. You are with me, so far, right?

Male: Yup.

Dr. Aristo Vojdani: Now, let's summarize it in a very nice way right here. The gene in yellow and you see, in addition to gene, dietary components, toxic chemical, infection together play a role in developing that autoimmune disease. Those who go to functional medicine like Dr. Husbands … I call you Douglas from now on … That this slide, the issue of home was introduced actually by our leader of functional medicine, Jeffrey Bland, many years ago. Exposome applies to toxic chemicals in the environment. Microbiome is about the bacteria in the gut. The genome, of course, we know. In addition to genomes, we should not forget the proteomes

also because the change of proteins is important. Metabolome, metabolism; and immunome; and finally, autoimmunome. These are the kind of words we have to pay attention to.

From that, I'm going to take you to the next level of the bacteria that … By the way, Douglas, I was very pleased to see that, how updated you are. Even you mentioned an article which I did not read yet. This is a summary of many, many articles together that the gut's bacteria plays a significant role in health and diseases. Please pay attention to your gut bacteria and keep it as healthy as possible. You have to have … The balance between good versus bad bacteria, always the balance should be in the favor of good bacteria such as lactobacillus and so forth.

Here, you see that these good bacteria playing a role in digestion of the food, nutrient supply, resist pathogenic infection, maintain barrier defense. We talked about that earlier. They're playing a significant role. You will see that good probiotics releasing all kind of mediators beneficial factors which repair the tight junctions. EPA, DHA from fish oil, the same thing. It's helping to prepare the barriers. Glutamine and N-acetylcysteine, many other factors together can help in repairing the barriers. The bacteria helps in maturation of the immune system. There is a type of cell, which tonight that you remember before going out to sleep, is Treg cells, regulatory T cell. Okay, it's right there. You'll see … we'll have more discussion about this.

Why T cell is so important? Because when the child is born, the immune system, as you know, it's not mature. That child is in a state of imbalance. It's like this: TH2 versus TH1. I'm talking about different mediators of the immune system. If the child is born naturally meaning no C-section and the mother breastfeeding, giving breast milk to that child, slowly, this situation becomes like this and balanced immune system. Which cell is doing that? The good bacteria from vaginal tissue plus various components of breast milk activating a type of cell in the gut called regulatory T cell or T helper 3 cell, and that's the cell which is balancing the immune system, protecting us, from one hand, against allergy, from other hand, against autoimmunities. Always, one of the best treatment for any disorder whether it's allergy or autoimmunity, to regulate the Treg cells.

Bacteria, the good bacteria, can activate natural killer cells. What are natural killer cells? The cells kill viral infected cells in our body plus tumor cells or cancer cells. In addition, natural killer cells communicate with T cells, B cells, helper cells, Treg cells and everything. Unfortunately, bacteria also can cause inflammatory bowel disease, can influence beyond the intestinal tract. I will show you some evidence that gut bacteria can affect the brain function.

Can also help, in this case, good bacteria to correct autoimmune disorders by transplanting bacteria … For example, husband and wife is having some sort of autoimmune disease, just give her some kind of antibiotic, destroy her bacteria, then take some bacteria from the stool of the husband and culture it, whatever

you know, the gastroenterologist, they know, and then you introduce it back into the GI tract and then re-implantation of those good bacteria by releasing good factors and all of that is going to repair some of the damage done in patients with autoimmune disease.

Or you could reverse this case, because the ladies may not like to have fecal bacteria from their husband but this, because of that, some gastroenterologist now, they … Actually, a company came out with taking bacteria from 100 healthy people and they made … They call it the bacterial bank, whatever you want to call that, okay? Then gastroenterologist now are using it for transplantation and they see fantastic results with inflammatory bowel disease. In some cases, can reverse inflammatory bowel disease. in this case, I'm talking even about autoimmune disorder.

Finally, improving liver function and so forth. That's very important to pay attention. Also, we heard earlier that these three factors: toxic chemicals, infection and some dietary components can change the gut microbiota. Chemicals and infections, all of that, oral bacteria releasing toxin, candida albicans, for example, can release proteases destroying our IgA which is a layer of protection. All of that together change the gut microbiota and then if it's eubiosis, that's perfect situation that we would like to see. Unfortunately, these three factors can change eubiosis to dysbiosis and the results of that will be systemic inflammation, asthma, atopic dermatitis, arthritis, multiple sclerosis, and 80 different other autoimmune diseases. The message is, please, take care of your gut microbiota as much as possible.

Now, you see that the message from gut can get to the brain. When the tight junctions here: occludin, zonulin, actomyosin, all of that. I don't have the complete drawing, but those are the tight junctions. When bacteria release toxins including candida albicans releasing certain toxins such as enolase, it's an enzyme, can breakdown the tight junctions. Now, unwanted, undigested food proteins, unwanted toxic chemicals, unwanted antigens get to the circulation to the submucosa then into the circulation, activating the inflammatory cascade in our body, inflammatory cascade plus the antigens themselves.

For example, lipopolysaccharides from E. coli; salmonella, shigella, other bacteria can now affect the blood-brain barrierbecause the blood-brain barrier and gut barriers from structural point of view are almost identical. Therefore, now the damage is going to the blood-brain barriers. When the blood-brain barriers are open, now that individual is in danger or developing neuro autoimmunities such as multiple sclerosis, Guillain-Barre syndrome, and others. From gut to the brain.

Now, so let's look at this experiment that was done by Dr. B in the Journal of Gastroenterology. This is one out of probably 30, 40 slides that I have that presenting only to you guys. Uh-oh. Thank you. What in this experiment they did was they took two strains of mice. One of them called BALB/c mice, which

naturally is shy or timid like me. The other one is NIH, National Institute of Health, Swiss mice, which is courageous, playful, and all of that.

Now, when we take babies of this mouse and the babies of that mouse, we take fecal bacteria from this mouse, transplant to the baby of that mouse, which is germ-free at the time of birth, okay, and you do from that to this one, their behavior changes completely. The playful becomes shy and the shy becomes playful. I have additional 20, 30 slides in relation to this kind of experiment. It's not done by me. It's done by the best scientist in the world. That's the science behind gut and brain and why fecal transplant is helpful. You guys mentioned also this article by Dr. Maes that … I will read only the title: The Gut-Brain Barrier In major Depression. What do you mean by that? Intestinal mucosal dysfunction with an increased translocation of lipopolysaccharide from gram negative enterobacteria, he calls that even leaky gut, plays a role in the inflammatory pathophysiology of depression. He has an additional 3, 4 articles even in chronic fatigue and fibromyalgia.

He treats the gut. The level of LPS and LPS antibody reduced symptoms of depression improves at the same time. That's, again, we connect the gut to the brain and behavior. Let me take you one step further that there are certain bacteria we cannot culture in a microbiology laboratory. By the way, the one that we culture in the laboratory, probably about 5% that we can culture. The other 95%, we cannot culture them. One of those that we cannot culture called segmented filamentous bacteria, SFB, segmented filamentous bacteria.

This segmented filamentous bacteria activating a type of cells or type of cell in our body called T helper 17. T helper 17 in the gut preventing parasitic infection. It has some kind of protective role. Unfortunately, like anything else, when it becomes overactivated, becomes pathogenic and attacking our own tissue, in this case, goes to the joint, releasing cytokines, and reproduce antibodies against the tissue. We call that the kiss of death for through joint. T helper 17 and T helper 1 can go through blood-brain barriers and attack the neurons resulting in neuroimmune disorders such as multiple sclerosis.

Unfortunately, when you look at children with autism because, again, you ask me to do that, they have more of this type of reaction; more T helper 17 in their blood or in their tissue than the healthy controls. Therefore, segmented filamentous bacteria or other bacteria can play significant role in different autoimmune disorder.

All of you were asking how many factors can affect the leaky gut? I made this almost 10 years ago. I am not going to exaggerate, every year I get 10 different request if I can give permission for people when they write a book to put this one in their book. Therefore, please look at all these factors. Don't forget psychological stress. Yes, definitely. You mentioned earlier. Thank you so much. That stress, by itself, can open the blood-brain barriers and gut barriers. Gulf War syndrome, I worked with our soldiers. When they're under stressful conditions,

they give them pyridostigmine bromide, it went through the blood-brain barrier and affected their brain. You want to call that PTSD? I'm not in agreement with that. That's not PTSD. Look at the gut. Look at the blood-brain barriers.

These are major factors all together. Lack of digestive enzyme. The enzyme produced by the bacteria candida albicans, oral bacteria can breakdown the tight junction. The results of that is autoimmune disorder in different part of the body. That's why based on some of these knowledge, almost 8 years ago I came out with this test. Why? Because I wasn't happy with the current testing at that time for measuring leaky gut. It's called lactulose mannitol. What did they do? They give you some sugar to drink. One of them is single sugar, the other one is double sugar. Then they take your urine and measure the ratio between the two, but that's leaky gut for small sugar. I am interested in leaky gut for antigens, bacterial toxins, candida enzymes, all of that which are large molecules. If they go through the barriers, obviously sugar could go through this but an antigen only can go through this much opening.

Okay, so therefore the opening should be very large in order to an antigen to go through and, therefore, we are measuring antibodies against bacterial toxins, which are major factors in opening up the tight junctions damaging the tissue releasing what? Actomyosin, occludin, and zonulin. Therefore, the body react to them when we make antibody against them. Measuring antibody against all these three factors is indication of having leaky gut to large molecules which their origin is from bacteria in the gut, in particular.

Another statistic. From Parkinson to Alzheimer's, stroke, cancer, heart disease, from 5 to 13 million; diabetes, 26 million; autism, ADD, ADHD, 30 million; autoimmune, 53; asthma and allergy, 60 million, but there is overlap between this as well. Therefore, we have to do something about this. We cannot sit down and just relax and say, "Okay, let's put you on immunosuppressants." That's not good enough, I'm sorry. We have to pay attention to the environmental triggers. Unless we remove the triggers from the environment of the patient, your patients are not going to improve, and these numbers will go higher.

Example. I'm going to talk about now the three factors. I'm taking you to the chemical world. Eighty thousand industrial chemicals. How many you think they were tested by the government before their introduction to the market? Five percent. I'm asking always, "Why the burden of the proof should be on the consumers and not on those who are making the chemicals and introducing them to the different products which we are using?" That's wrong. In fact, every year, 2,500 new chemicals, chemicals that are in more than 6 billion different products which we are using some of them every day. Some of these chemicals resist metabolism or even when they get metabolites, our metabolism is going to take care of that, the metabolites bind to our own tissue.

Therefore, they get accumulated in our tissue. Therefore, what is the value of today measuring chemicals in the urine and blood? All of us we have hundreds, if

not thousands, of them in our blood and urine. We have to measure the body burden of chemicals, those chemicals which get metabolized and bind to our tissue and stay there forever. We call that lifetime exposure to chemicals. That's why I developed a test for that which is part of ARRAY 11, which you picked up some of the literature from there.

What do you see in here? Let's have some fun, right, good food. I was on one of these famous flights and it was dark completely and they serve you dinner, international flight. This was the dinner. It was so hot. Let's look for a second. What is this?

Female: [Inaudible 00:33:46].

Dr. Aristo Vojdani: Okay. What is that?

Group: Aluminum.

Dr. Aristo Vojdani: Aluminum. What do you see? What are those, the shining … Yeah, chicken, but is there shiny stuff in there? From the aluminum went over there, right? The only thing I did, believe me, I took my telephone, took a picture and that was the end of it. That's all. Please pay attention to what we do, first, as a clinicians and as practitioners ourselves, and then teach your patients.

Example: What is this?

Group: [Crosstalk 00:34:32]

Dr. Aristo Vojdani: Those coffees that you put automated in the machine and you push it and then hot water, boiling water goes through that, and you drink the coffee. What do you do here? You have a mixture of coffee. I'm not saying coffee is bad for you. Pure coffee, in fact, is good for you, but when it's mixed with bisphenol A and probably many other chemicals, it's poison. Please teach your patients every day to pay attention. What is wrong with this?

Group: [Crosstalk 00:35:08].

Dr. Aristo Vojdani: Okay. What do we have in this milk?

Female: It's not milk.

Dr. Aristo Vojdani: Well, whatever it is. There is some fat stuff in here, right? The fat is dissolving the plastic as well. Then, also, you go to the bar, right? Or you go to certain parties. They give you alcohol in what?

Female: Plastic.

Dr. Aristo Vojdani: In plastic. What happen? Alcohol is dissolving the plastic. In the laboratory settings, please remember, three things never we should do. Oil in plastic is poison. When you buy oil for the kitchen, buy the one non-GMO and is in glass bottle. These are small things but we have to learn, because chemicals are oil soluble. Bisphenol A is oil soluble. That's why chemicals go and bind to our fat tissue and stay forever. Secondly, alcohol. Anything in the lab that we cannot dissolve in water, we dissolve it in alcohol. Then the hot water and all of that. All together, please, these three things should not be done in addition, of course, organic food.

That's why if you go to scientific literatures, there are titles like this. For example, Michael Pollard is one of my friends which we edited special issue of autoimmune disease last year, and if you would like to read a couple or several articles in that tissue of 2015, 2014, exactly about this talk under Vojdani, you can download that because it's free. The role of environmental triggers in autoimmunity written by me, but Michael Pollard wrote also several articles about this. He's from Scripts Clinic. Toxicology of Autoimmune Disease, what do you learn from that title? Toxicology of Autoimmune Disease.

Without reading, what is in there? What do you learn from that?

Female: [Inaudible 00:37:35].

Dr. Aristo Vojdani: Autoimmune disease has some connection with toxic chemicals. I don't need to read more than that. These days, we have time only to look at the title, maximum to read the abstract. That's all we can do. That's why I came out with this panel. We measure antibodies against aflatoxin. Aflatoxin is everywhere. It's not just in peanuts. Any food that we eat has some kind of connection with the earth and so forth. Molds grow, release aflatoxin, and aflatoxins bind to the proteins of the food and peanut is only one of them.

Formaldehyde, isocyanate, trimellitic anhydride, benzene ring solvent, they're found everywhere. They're found everywhere, not only in the carpet, in the paint, plasticizers. Bisphenol A is not only in plastic. You have trimellitic anhydride, phthalic anhydride, formaldehyde, and even in some of those paper cups. Ask yourself how they manufacture paper. Paper is … Probably they take some trees and then add some kind of plasticizers to them to make it look like that.

Therefore, we have to go back to nature. If you want to prevent autoimmune diseases, we have to go back to nature. Is it possible to do it? To some degree, yes. Biphenol A … I got the introduction about that. What is bisphenol A binding protein? There is an enzyme isomerase in the brain. Bisphenol A, if crosses the barriers, bind to that enzyme and makes that enzyme completely dysfunctional. Therefore, chemicals affect the brain. It's not just endocrine disruptor. They can affect the brain function. Then tetrabromobisphenol A, fire retardant, all of that.

you buy furniture. You buy mattress. In California, they have to spray. Why? Because 5 seconds delay in a fire, 5 seconds. That's a fact.

In the meantime, we sleep on that mattress and our skin is the largest organ in our body. It comes in contact with that; on the couch, or whatever, we absorb those chemicals. Tetrachloroethylene, dry cleaning. Parabens, ladies, please, pay attention to parabens. Use healthy cosmetics, green cosmetics as much as possible. I cannot convince my own wife, okay, but you ladies are stubborn. You guys, stubborn. When it comes to beauty, your beauty is … How do you call it? Is more important than just the chemicals you put on your hair or on your body or on your skin. Please pay attention to that.

There are alternatives. We are blessed to live in a country that we have alternatives for everything. It costs a little bit more money, but it's okay. It's for your health and your patient's health. Then finally, mercury and heavy metals. Don't blame everything on amalgam. Fish is contaminated with lots of mercury and other heavy metals, so we have to remove … If you consume or your patients are consuming fish, teach them what kind of fish to use.

If you want to read a little bit more about this, this article was written by me because I was asking this question, "What percent of population?" If I measure antibodies against those 12 chemicals in their blood, not against the chemicals; chemicals bound to human serum albumin. Albumin is the highest amount of protein in our blood. We found about 20% of healthy subject, not with autoimmune disease, healthy subjects, had antibodies against some of these or all of these chemicals. That's Journal of Applied Toxicology. You can download it again. You can download it with no problem because I purchased the right for the PDF of this manuscript.

Regarding the chemicals, let's summarizing it and this is the best slide to summarize, and then I move to the next, probably will be the food, and then the infection, and then I'll put everything together. Chemicals, depending on genetic factors. Some people, for example, go to the gas station and say, "Oh, fantastic smell." It's better than perfume. When I get there, I get headache because I'm chemical sensitive. That's why I developed these methodologies.

Chemical exposure, genetic factors, barrier breakdown, oxidative stress, formation neo-antigen. What is formation neo-antigen? Chemicals get into our body, bind to our tissue, form new antigen, changing the structure of our thyroid, the structure of adrenal gland, that structure of other part of the body and then our immune system wrongly … it's going to attack our own tissue. That's autoimmunity. If you ask me what shall we do for prevention of autoimmune diseases, remove the triggers. In this case, remove the chemicals. Proinflammatory cytokines, inflammation and autoimmune reactivties. So far, you are with me about the importance of chemicals and why it's so important to remove them from your own environment, first. I'm talking about practitioners, and then from the environment of your patient.

Let's move on now to the next part of this. This is a good slide that taking us to the next. I mentioned neoantigen, neo-antigen. Our body is not making antibodies against toxic chemicals by itself because they are very small. They have to bind to our tissue in order to make antibody against that. Here, the proof that bound zenobiotic residues in food commodities of plants and animal origin. If you take fish, the mercury is bound to the fish protein. You buy peanuts. Aflatoxins or other chemicals, pesticides, are bound to the protein of the peanuts. Therefore, when we consume those, what will happen? Body burden. Accumulation in our tissue.

That's why you see all these chemicals in here, because whether it's water, the fish, cattles, meat, and so forth, we are the end users. Chemicals bind to our tissue, now our body is trying to attack the chemicals. By mistake, it also is attacking the tissue which chemicals are bound do. That's immune system against neo-antigen, immune system reaction against neo-antigen.

I mentioned peanuts. Let's go Mr. Peanuts. Protein, 63%; Fat, 22%, which is a good fat; Fiber, 10%; the most important is the others. What is the others, 5%? Aflatoxin, pesticide, herbicide, heavy metals. What do you do? If you know that there are 5% of all these chemicals in the … Which one you choose? The organic peanuts or regular peanuts? By the way, in some cases, there are some articles saying that even organic peanuts, they have more aflatoxin, but not pesticides and herbicides and heavy metals. Here's it's huge dilemma what to do.

Let's take you to the next level and say okay. Let's say we are using pure peanuts. These are amino acids, which make the protein of peanuts. When we consume any protein, we have digestive enzymes. Good digestive enzymes can digest proteins to peptides and then we get amino acids. The amino acids gets absorbed and that's fuel for our functionality. Even if one peptide will not be digested, the Treg cell, the T helper 3 cell which I was mentioning before, it's job is to block that by producing pro-regulatory cytokines, TGF beta and IL-10, and preventing any immune reaction to that single peptide. You are with me so far, right?

Now, next is what if these chemicals are bound to different amino acids of the protein? The digestive enzymes, no matter how functional are, they can do to certain level their job. What will happen that we'll have a lot of undigested peptides in the gut? Therefore, no matter how strong is Treg cell, it's not going to block that inflammation. Therefore, the peptides get to the submucosa, to regional lymph nodes, to the blood, we react against them and we make antibody against them. That's why you detect antibody against gluten, for example. By the way, that's why it's so important sometimes to give enzyme as a supplement to your patients.

Food immune reactivity and autoimmunity. Sorry, I didn't have another choice. I'm drinking from this, but I'm drinking wine in glass, right? I don't know how

much you guys know. In 1986 and the story is only in that special issue which was in here. I have a few more copies for those who ... You did not get them, the special issue of Alternative Therapies in Health and Diseases about food immune reactivity. Why am I calling this food immune reactivity? It's wrong to call IgG or IgA or IgM testing food allergy. I developed with IgG testing in 1985, and I am equally guilty of doing that because all other laboratories, like mushroom, started picking up my technology, they changed it completely and actually destroyed it completely, and then offered many false testing. They call that food allergy or intolerance.

This is not food allergy. Food allergy is if you make IgE antibodies and if you eat something, right away, and you have allergy to that, you have to go to the hospital. That's realogy. In this case, I'm interested in food immune reactivity. If we're yet against that, that antibody can attack because of similarity within food with human tissue, can attack all tissue resulting in autoimmunity. That's the message that I'm trying to teach more people about this. That's why I wrote 7 manuscript in the journal in order to describe this. I'm just showing you a few slides.

Why? Because wheat is not the only food causing cross-reactivity with human tissue, but let's use this one because we have the most evidence about it. how many autoimmune diseases you see in here? Wheat proteomes, meaning many proteins of wheat, can cause all these autoimmune diseases including multiple sclerosis. Lupus, autism, neuromyelitis optica, and many others in all of these that are in here, based for every one of these, I have a binder that they have the articles supporting each circle.

Earlier, some of you were interested on the mechanism of action, how can this happen? Back to the digestive enzymes. Look at this here, digestive enzyme. You can change this with any food, with potato. It doesn't have to be just wheat. You can change that with milk. Any food, digestive enzyme, if they are dysfucntional, they don't digest properly and I gave you a reason why digestive enzyme do not work before. What will happen to that? We'll end up with undigested peptides.

Unfortunately, on the epithelial cells, there are receptors for some of these peptides. Bind to that peptide, bind to that peptide, binds to that receptor, called CXCR3 which is a chemokine receptor, and then after binding, some kind of mediators are released which breakdown the tight junction, and that peptide goes to the submucosa dendritic cells and other cells of the immune system, react to that, release cytokines, pro-inflammatory cytokines and antibodies, together damaging the tissue resulting in destruction of the villis. This is a mechanism, but even unpublished, which will be probably in my book which I am in the process of writing for next year. This could apply to any other food. Therefore, again, digestive enzymes and active digestive enzymes are very important for our health.

In relation to wheat, in wheat, we have at least close to 50 different proteins if you do analysis. The question I asked is based on my earlier research, almost 10 years ago with Lyme disease. Because you guys have Lyme disease in this area, I would like you to know that we have one immunosciences lab, we have one of best Lyme disease tests that some of you may not be aware. It was based on the following that when borrelia gets into human system, it's so smart, changing its antigenic structure in order to hide from immune attack. Therefore, making new proteins and peptides during this process.

For diagnosis, what we do, we grow borrelian culture. Almost every laboratory I know, they use borrelia grown in culture, but that's only 50% of the antigens. The other antigens, you have to find them and also measure antibodies whether it's IgG or IgM against borrelia grown in culture, which everybody is doing plus those antigens expressed in human system. There are three subspecies. Everybody is doing only one of them. How about the other two? Then there are co-infection such as babesia, ehrlichia, and bartonella.

That's why we do 12 different determinations. When I was reading at the same time some articles about wheat antibodies and gluten sensitivity, I found out actually, everybody almost, is measuring antibodies against alpha-gliadin and enzyme called transglutaminase 2. These two only. Today, if you want to send the test for celiac disease to LabCorp, that's exactly what they do for you, antibody against that, antibody against this. My question was "Is this enough?" Then I started reading article that if you do that, you miss 50% of the cases of Celiac disease and many percentages of patient with non-Celiac gluten sensitivity, which, in my opinion, is more important than Celiac disease. Because Celiac disease, we can do endoscopy, whatever and you can find villous atrophy.

In non-Celiac gluten sensitivity, the gastroenterologist will send you home, and how inflammation and autoimmunity is going to continue for years, and then after 10, 20 years, unfortunately, one may develop autoimmune disease, some of those which were in my slide. Therefore, I came out with this test. I said, "Well, how about wheat germ agglutinin? How about gamma-gliadin, omega-gliadin, glutenin, gluteomorphin?" For example, children with autism, they react mostly to this part because those are morphine like material goes to the brain area biding to the receptors in the brain. That's why hyperactivity, when you remove gluten from their diet, their hyperactivity will go down.

Then comes to transglutaminase. Transglutaminase 2 is in the gut. Now, there are articles and scientific journal, transglutaminase 3 is in the skin that's why some patient develop dermatitis herpetiformis. Finally, transglutaminase 6 is in the brain. We do all of that, and I'm very proud that such a test that was developed by me and it's available for testing at Cyrex.

Then let's say you have a patient with Celiac disease, classical Celiac disease and let's say it was diagnosed correctly. Then you put them on gluten-free diet and they don't improve. You can blame the patient that the patient is cheating. That's

one way to look at it. The other way is patient is okay maybe because we did not remove the cross-reactive foods from the diet of the patient. Therefore, the patient is not improving significantly. That's why I came out with this test, by looking at cross-reactive foods.

For example, cow's milk cross react with gluten. In my opinion, this is personal. Please if you disagree with me, it's up to you, but in my opinion, there is no such thing being on gluten-free diet and not to be on dairy-free diet. Those are necessary. For autoimmune diseases, the same thing. Okay, the other question is not everything is in here cross react. For example, you have a patient. You put that patient on amaranth. How do you know that patient really is not reacting to amaranth? You have to do the testing. Therefore, don't blame everything on gluten and casein. Other antigens could do the same thing.

This is a test I did to prove cross-reactivity, which is naked eye, you can see the results. A journal called Food and Nutrition Sciences, 2013 … Again, you can download that anytime you have an access to a computer under Vojdani and look at the detail of this article. Because of the controversy of cross-reactivity, all of that … The other day I was looking, there were about 3 million hits in relation to this article. That's a lot. Therefore, what are the cross-reactive foods? All the milk groups. This is the gluten, right? When you add anti-gliadin to gliadin, you get color. Color developing meaning reaction. This is 100% reaction. A little bit with milk, but look at alpha casein. Not with casomorphin, milk butyrophilin with oats, okay, and this is pure oats.

Then with egg, nothing with corn. If I will look at the percentage, this could be around 50 or 60 percent cross-reactivity with that. Yeast, brewer's yeast and baker's yeast, I will say about 30 or 40 percent. Instant coffee versus Starbucks or other coffees, pure coffees, pure coffee didn't have any, so where did that instant coffee is coming from? From contamination. That's why if you go, for example, to Folgers website, now they say, "We are trying our best to have our coffee not being contaminated with gluten," so we make a difference. Thank you. Therefore, millet, rice.

Then I wanted to see if gluten antibodies cross react with human tissue. The answer was yes. Which tissue? Cytochrome P450 in the liver, their job is to detoxify us against chemicals and gluten can cause dysfunctional enzymes in the liver. GAD65, it's a biomarker of so-called Type 1 diabetes, but also it's found in the brain, and so therefore, that's neurologic antibody. Collagen, a little bit. Then all these neurologic … asialoganglioside. Synapsin, what is synapsin? A protein at the synapses. Then cerebellar. You heard a lot that children or adults develop ataxia. You remove the gluten from their diet, they improve significantly.

Today, my friend from Santa Rosa, Dr. Ambridge, was driving me. He gave me during an hour and a half drive cases after cases that he had when he put them on gluten-free diet, after 30 days, complete changes in their behavior, which is, I decided to help him to write them up and publish them because people should

know about this. Again, if you don't publish, no one will know about this. Let's continue now.

Milk protein, its relationship to all these disorders. Type I diabetes, children on, for example, formula versus hydrolyzed", whatever you call it, milk … Hydrolysis, they get less. That's normal milk from cows causing diabetes. When you change the structure, less diabetes. These are all disorders associated with various autoimmune disease due to protein in the milk, which some of them overlap with the one with gluten. Again, one of my friends 4, 5 years ago asked me, "What do you think will be percentage of population, healthy people, who make antibodies against wheat and milk?" Because I'm working in the field, I told him about 20%. He was writing his book. This individual is Dr. David Perlmutter. He wrote this famous book, the Grain Brain.

I think he put it in his book, but because of that, I did this study on 400 healthy people and the answer was very close to 20%; 20% against wheat, 20% against milk, and some overlap between the two, but the issue that this part. How much that can contribute to neuroimmune reactivities? I call it neuroimmune reactivities, meaning how many of them make also antibodies against their own brain tissues? Half of those.

Ten percent of right now healthy people walking, they make antibody against gluten, they make antibody against milk, and those antibodies attacking their own tissue. That's the answer. Again, this article is available for free. Nutrient, journal called Nutrients.

Lectins and agglutinins. I mentioned earlier about wheat germ agglutinin, but please, there are many other lectins and agglutinins in different foods. If you are vegetarian doesn't mean that's 100% healthy for everybody. Some people cannot digest. In fact, if you give an individual uncooked beans, they can die from it, because of lectins and agglutinins, are not digested properly by digestive enzyme. Unless you cook them properly, they will be digested. Therefore, lectins and agglutinins are associated with many disorders. It is in one of those articles in the journal. Pay attention to those.

The food coloring, okay. I used to go to many Indian restaurants. I used to love tandoori chicken until I asked the chef in at least five different restaurants, "Are you using saffron or curcumin to make that?" He said, "No, we are using food coloring." Okay, so be careful. Then when you see something like that, also be careful. That's immune reaction. That's reaction of chemicals with human tissue. I read this article about a person with green colon syndrome. He was drinking a lot of drinks with the green color, and then the whole colon was green.

Now, there is something else in here. What is that? Vinegar in a plastic bottle. What is the pH of vinegar? About 2.1, 2.2. What if I'll tell you any of these, any of these, their pH is exactly like vinegar and you guys are buying them every day. After years of being in a contact with the plastic, pH 2.1 and then all the

chemicals are in those drinks. Please educate your patients about this type of things. This is part of the remove, detect and remove. Sometimes you don't need to do laboratory testing.

Female: How about lemon juice in plastic bottles?

Dr. Aristo Vojdani: I'm sorry?

Female: Lemon juice in plastic bottles.

Male: Same.

Dr. Aristo Vojdani: The same thing. I wanted to make a slide actually out of that plastic lemon, in the shape of lemon, that's the best example. Thank you for mentioning that. The bottom line: Educate. Educate. Educate. For example, there are some autoimmune diseases associated with this, lipstick, an autoimmune disease. Please, I beg you, food coloring. It is labeled … Go online and check … It is labeled as a toxic material. It's not by me, it's by the government. Why they allow it? Because it was grandfather, 60 years ago, it was before FDA was in place. Therefore, grandfather and they're using it with no problem. You have to remove that from the diet of your patients.

Why? I have to do this in order to convince you. If you take a peptide and the scissor are digestive enzymes, what do they do? They cut to amino acids, and they get absorbed. Now, what will happen in here if the chemicals are bound to that, if the food coloring is bound to that? The scissor is not working. The enzymes become dysfunctional. Therefore, you have to, again, educate. Experiment was done in the laboratory. If you take a protein, add to that digestive enzymes, the protein get digested in two hours completely, 100% to amino acids. Add to that food coloring such as tartrazine, which is the yellow, then add the enzyme. It took them 8 hours to digest only 80% of it, not 100%. The message is clear, it's not good for your gut.

Therefore, let's close this part about the importance of foods and food colorings and all of that; chemicals already we talked about; and so therefore, in testing for food immune reactivity, not food allergy, you have to test for raw food if you eat raw food. If you cook food, you have to measure antibodies against cooked food. I know maybe 5% of the population is eating raw meats, but 95% like to cook the meat and eat that. The antigen of raw meat versus cooked meat, these are two different world. Therefore, you have to measure antibodies against exactly what we are consuming. Banana, sometimes you cook it. Yes, you have to measure antibodies against raw banana and versus cooked banana.

There are certain vegetables we eat them raw. If it's roasted or raw nuts, we have to measure antibody against both because these are two different antigen. Meat, I mentioned. What is meat glue?

Group: [Crosstalk 01:12:08].

Dr. Aristo Vojdani: Okay, just one second. Let me get one of the journals I have with me. Sorry. Sorry for the camera. I have more journals for you for those who did not get it. You see the cover? What do you see in here? This was breakfast served in one of the cafes in Las Vegas when we were at anti-aging medicine in Las Vegas. Have you see really natural meat like that? What they do? They take all kind of junk and add to that meat glue which is transglutaminase made by a mold. They glue everything together and they cut it to pieces that you don't see any … Even the butchers cannot differentiate sometimes between meat glue versus normal meat, I call. You have to measure. Meat glue is everywhere, in many, many products. Therefore, that's why we have to measure that.

Fish, shellfish, gums. Gums are everywhere. Read the labels. Do you think that our immune system can react against gums? What do you think? Absolutely yes. Why? If we take a protein, for example, egg albumin, the size of that is only 48,000 dalton, okay? Gum could go all the way to 2 million to 5 million, a huge, huge molecule. Therefore, we can even break it down by our enzymes, still is so antigenic that we make antibody against that. Again, you can read in the journal about this. Food coloring, autoimmune … Oleosins, what are oleosins? Oils that you buy have some proteins in them. Therefore, if you have allergic child, child allergic to peanuts, you cannot have peanut oil at all or soy because there are some proteins at soy. Very small amount can challenge the immune system. Lectins and agglutinins already I mentioned, and there are enzymes and so forth. That's why we have to do our best.

There are other foods that cross-react with human tissue. One of those disorders called neuromyelitis optica. Neuromyelitis optica actually is equivalent to MS in Japan. A couple articles written in Journal of Neuroimmunology 2014 about association between neuromyelitis optica, corn aquaporin, tomato, spinach and soybean. They believe because they consume so much of these products in particular, spinach and soy and aquaporin of those four items almost identicals to human aquaporin. What is aquaporin? It's water channel protein. Water channel proteins. Where? In blood-brain barriers. You make antibodies against soy aquaporins, turns against your own aquaporin in the blood-brain barriers causing inflammation and then autoimmunity, in this case, neuromyelitis optica.

A couple more slides to convince you that, really, the issue of food immune reactivity should be about allergy which is IgE mediated and the other antibodies is about immune reactivity and autoimmunity. Why? Because, here, a couple more examples. If you take a patient with mixed connective tissue disease, scleroderma, in this case. Take blood from that patient and purify to 100% pure against DNA topoisomerase. That's the target tissue antigen in patient with scleroderma. Then react that antibody with different foods. The following 4 foods were highly reactive to that: wheat germ agglutinin, peas, corn, and spinach. Another meaning, unless you remove these four items from the diet of

patient with scleroderma, that patient is not going to improve. That's why the message of detect and then remove.

The same thing with patient with lupus. Purified antibodies which are made against ribonucleoproteins, meaning the proteins in the nucleus of the cell, react that with different foods. Again, look at that: Spinach, corn, carrots which wasn't there before, and soy. Soy again is there. Now, whether is this is GMO or non-GMO, I don't know, but the proteins of soy are there which cross-react with human tissue. The same thing, spinach and corn and so forth. Therefore, the issue of food immune reactivity, when you send that to a reliable lab and the patient is reacting strongly to that food, you should remove that food from their diet. That's it.

Okay, there is no rotation. Some people, they give you all these booklets, beautiful booklet. The only thing that's beautiful about their test is the booklet that they give you, how to rotate, all of that, which has nothing to do really with the testing. That's why I put these 7 articles together and I have few more copies in here for you.

Regarding the chemicals, we already talked about. Regarding the food, I think you got the message. I can look at you, none of you are asleep here tonight; and the infection. The infection, actually, in my case, I was in graduate school when I was doing my Master Degree when my mother developed full blown arthritis. I took her blood and her friends also who were helping. At that time, we're doing agglutination. We didn't have all these luxury that we have today like ELISA and all these fancy methodologies. Whatever I did for my PhD in 5 years, I can do it in one week today. Believe me.

Therefore, with that methodology, I showed that she was having antibody in her blood against porphyromonas gingivalis, which is the agent of periodontal disease in human. What happened? She had infection in the gum going to dental technician, removing, while she had the infection, 3 or 4 teeth at the same time. The toxin was released opening the tight junctions, going into the blood, activating today we know T helper 17. T helper 17, kiss of death to the joints, and after 20, 30, 40 years, you saw the picture.

Therefore, I would like to share this with you, guys. Just one out of so many articles I read: Porphyromonas and other bacteria as well as the pathogenesis of rheumatoid arthritis. What is the mechanism? It's described in my own article in a journal called … The special issue Autoimmune Disease that bacteria releasing the toxin, right? Right there. What is going to happen to gut microbiota? Obviously changing gut microbiota; the toxins changing the gut microbiota. That, by itself, can cause opening up the tight junction, destruction of occludin, zonulin, vinculin, actomyosin, and so forth. When the tight junctions are open, that is the gateway to autoimmunity.

All of that activating certain enzymes, alpha enolase becomes citrullinated. One amino acid changes, we make antibodies against citrunillated alpha enolase, now every protein, when becomes citrunillated in our body, next time the body will attack that and we call that actually some kind of epitope spreading, and body will make simultaneously antibody against 3 or 4 or 10 or 20 different antigens simultaneously, all because a single infection or couple infections are infection in the mouth. In this case, due to porphyromonas gingivalis but other bacteria as well involved.

Because of that and because of my passion in this area, I'm coming out with this panel. Right now we are doing research and development. Hopefully within 3 months we'll be available. It's called Pathogen Associated Immune Reactivity, oral bacteria and then helicobacter pylori in the gut, campylobacter jejuni, yersinia enterocolitica, clostridium difficile, candida albicans, rotavirus. All of these share antigenic similarity with human tissue. Bacterial cytolethal distending toxin, those are the toxin released by bacteria, destroying the tight junctions, in addition to lipopolysaccharides. There are more. Therefore, the idea is to look at the most infectious agents, including mold, including the agent of Lyme disease, babesia, ehrlichia, bartonella, so all together … Hepatitis C, cytomegalovirus, Epstein-Barr virus … All of that together will be offered as a panel for detecting the role of pathogens in our immunity. Then we talked about the chemicals, we talked about food, and now the infection.

Let's put everything together. Why one will develop autoimmune disease due to some of these three factors? We have two mechanisms of protection in our body against autoimmunity. Number one, it's called oal tolerance. Remember, I was saying that the baby is born, the baby is going to develop good oral tolerance, meaning can tolerate friendly bacteria, friendly antigen, can tolerate the food, but that's only if the child had normal birth, natural birth, no C-section, and child was breast fed. That is mechanism of induction of oral tolerance.

Why in breast milk there are so many factors, including cytokines, which regulate the Treg cells , which is involved in induction of oral tolerance? I read in newspaper that 60% of hospitals in the U.S., they don't have facilities for natural birth anymore. Another meaning, they impose it on you to go through C-section. It's unacceptable.

Female: What's wrong with C-section?

Dr. Aristo Vojdani: I'm sorry?

Female: What's wrong with C-

Dr. Aristo Vojdani: I just explained to you. There are good bacteria in vaginal tissue. As soon as the baby goes through vaginal tissue, it is going to acquire your good bacteria, the mother's good bacteria, where immediately start activating the immune system

from this state to become like this, to balance the immune system and prevent allergies and/or immunities in the future. This is the mechanism right here.

Female: The baby cannot get those bacteria from other place instead of the mother?

Dr. Aristo Vojdani: If you can do that, it is possible.

Female: [Inaudible 01:26:23].

Dr. Aristo Vojdani: Yeah. Well, the question is why … Okay. Well, let me finish the presentation, I think it's better. I'm sorry because I have to finish with the state of my thought. Okay, so oral tolerance versus the second mechanism is the thymus gland. Why thymus gland is so important? Because lymphocytes migrate from our bone marrow to the thymus gland to acquire the T, the T cell which we call, it comes from the thymus. Any lymphocyte with receptor for self-tissue, there is a computer within destroying that.

Any lymphocyte with receptor for non self-antigen, bacteria, viruses, parasite, they have to get the ammunition then they go to the blood and the tissue and, therefore, protecting us against autoimmunities in the future. Now, which one do we have more control over to prevent? Which mechanism is more sensitive to environmental factors, those three that I mentioned before? The toxic chemicals, the infection, and foods that we eat, which one is more sensitive? Obviously this mechanism, the first one, the oral tolerance. Therefore, removal of those can prevent breakdown in oral tolerance and repairing the gut areas.

Autoimmune disease, unfortunately, many years of suffering, all kind of tissues. Sharing with you this antibody, after almost 45 years of research and development, and so developed this test because we have to measure antibodies against almost every single tissue in our body to see whether or not those three triggers cause autoimmunity, autoimmune reaction in our body. Therefore, from the gut all the way to the brain we measure different antibodies to find where is the weakness in our system, and therefore try to treat that part.

Why? Because there are three stages of autoimmunity. Please, we'll take a little bit more time on this slide because this is very important message. Silent autoimmunity, like you did ARRAY 5 and you find three or four or five different antibodies are elevated. That doesn't mean your patient is having autoimmune disease because you detected antibody. Patient doesn't have any symptom, but will take 3 t0 5 years, will go to stage number 2 if you don't do anything about this. Patient is having antibodies and some symptoms and some loss of functionality. If you will not stop at this level, unfortunately will be too late because stage number 3, patient is making antibodies and there is a significant loss of functions sometimes impossible to reverse. Only you can stop it at that level.

Therefore, it is very important to detect autoimmune diseases at the early stages possible, meaning the silent autoimmunity. Patient makes antibodies, the antibodies are not damaging yet, you can repair the gut, you can give all kind of supplements and prevent progression from stage 1 to stage 2 and stage 3. The message is that if you have a patient with autoimmune disease, the stage 1 probably started 10 to 15, sometimes 20 years earlier; therefore, there is a window of opportunity to intervene and do something about it.

That's why these are different ARRAY's I developed for Cyrex where it's important to do but some of you may ask this question: Where shall I start? The patient is coming to me, where shall I start? I don't know. The patient is having only $200. I don't want to spend $5,000 on my patient. I honestly will start, if I was the clinician, from the gut. If the patient is having leaky gut or not, from ARRAY 2, okay? That's one way.

Another way, you start from ARRAY 5 if there is autoimmune reactivity and then ask question where this is coming from. Is it leaky gut, is it gluten, is it cross-reactive food, other foods, and so on? There is one more option also, when you do ARRAY 2, do also ARRAY 20 with that because one is talking about gut barriers, the other is about blood-brain barriers. It's not that expensive test, so that's another option.

Again, these are different options and then you try to find the triggers. Is it the chemical? Is it the infection? Is it the food? By removing the triggers, I hope we'll be able to help your patients and prevent the worsening of their conditions. Detect first then remove the triggers, detoxify the body, treat the infection if its patient, for example, is having gum infection. In my opinion, you should minimize medication.

When I go to doctors, they ask me question of what kind of medication I'm using. When I answered none, they cannot believe me. You have to be on 10 different medications today in order to be a normal person, so I am abnormal person. I'm very proud of that. Drink pure water, not in plastic bottles; remove the offending foods from the diet; eat pure foods, minimize lectins and agglutinins, and probably you guys can add to that list. Detect and remove the triggers.

Finally, the last few slide is about repair the barriers. Repair the barriers, in particular, you have to regulate the Treg cells. You want your Treg cells will be super functional. Some example: artemisinin, glutamine, vitamin A, vitamin D, probiotic, short chain fructooligosaccharides, EPA/DHA meaning fish oil, green tea extract, resveratrols, curcumin, and many more. You guys are better than me even in that and you can alter that list as much as you like, you guys like to do.

Don't forget, please, walking, not running. Walking, walking, walking. Why walking? Because walking activates the brain cells to produce nerve growth factor that can repair the barriers and also repair damaged neurons. If you have a family or family history of Alzheimer's, Parkinson's, all of that, please start at

early age as possible. Walking, walking, walking, in addition to taking some of these supplements. Detect, remove, and repair.

What else we have for repair? There are good microbiota. I would like to emphasize this one more time, based on this article I read recently in Journal of Autoimmunity. If you give fiber to your patient, what will happen? Soluble fiber such as pectins, fructans, cellulose, all of that. Look what will happen, okay? The good bacteria is going to flourish. When the good bacteria is going to flourish, what will happen, they are going to release acetate, butyrate, and propionates. Those three factors are going to activate the Treg cells. The Treg cells now are going to release all kind of cytokines and can prevent any inflammatory response in the tissue. That's why it's not enough to give probiotics. You have to give prebiotic to feed the probiotic.

Next, Trends in Immunology, January 2015. That our Treg cells, which is this one right here, loved vitamin A, vitamin B3, vitamin D3. This is in the Trends in Immunology, one of the best journal in the field of immunology. They tell us there are receptors in our cells, Treg cells, in the gut and everywhere in our body for vitamin A, vitamin B3, and vitamin D3. It's easy to remember.

Therefore, it's good to give this vitamin to your patients regardless of what we read in here that vitamins can kill you. Right here. Vitamins that kill, okay? Right here. Scientific America. That's one of the advantages in addition to meat. Meat. Very nice people like you guys, also you have extra time and you buy all kind of, in this case, I love Scientific America because it's very simple and then you find the article that you like at least to talk about it, okay? Then vitamin D9 here, all of these, so all together the Treg cells love vitamins, in particular, vitamin A, vitamin B, and vitamin D. That was the mechanism of action.

Finally, additional slide from reading different literature, different articles, and again you can extend this list as much as you want, but that's why for repair, cocoa powder. That's why dark chocolate is so important. Vitamin B, Vitamin A, boswellic acid, N-acetylcysteine, L-glutaminase, and we already mentioned rice bran, sulforaphanes from cruciferous vegetables, vitamin C, vitamin E, palmitic acid, dimethylglycine. Purple corn, because the color, purple, is really it's antioxidant. Bromelain, trypsin and papain, those are the best digestive enzymes. Maybe that's the mechanism why they work against inflammation and autoimmunity.

Probiotics, already we talked about; bacterial short chain fatty acids, lactoferrin if you are not sensitive to milk, okay? This is sodium benzoate. I have an article in Journal of Immunology. I'm sorry, okay? They proved that it's good for some of the cells of the immune system, but don't be surprised. Today, my friends we're talking about methylene blue is given to all kind of patients with inflammatory and even cancer.

Male: [Inaudible 01:39:23].

Dr. Aristo Vojdani: It's causing production of nitric oxide, which is good for you and me, right? Flavonoids and plantains and plant phenols, and all of that. Then finally, I mention here IVIG because there is a good mechanism in scientific literature about in some patients, that if you give them IVIG, when all of that is not going to work, IVIG can also regulate the Treg cells. With that, I hope my message was clear tonight that autoimmune disorders, which 53 million Americans and 10% of the world population is suffering from, should be detected at early stage as possible, to use reliable test. When you detect based on reliable test, you remove the triggers. Based on some of these and your own experience, please try to repair the damages done and then at that level you can prevent many suffering, many years of suffering in autoimmune diseases. Thank you for that. I'll be very happy to answer questions. Thank you.

Speaker 1: Thank you. Thank you. Thank you. Thank you very much. We're going to take a 10, 15 minute break. I'm going to leave it 10 minutes so everybody can use the restroom. We're going to come back and have the rest of the time for questions.