Reducing autoimmune risk by balancing your gut

Guest: Dr. Tom O'Bryan

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Kirsty Cullen - [00:00:15]

Hi, I'm Kirsty Cullen, CEO at the Optimum Health Clinic. Welcome to the Fatigue Super Conference. Today I'm absolutely delighted to be joined by Dr. Tom O'Bryan. Tom is, of course, very well known and regarded in the functional medicine world as somewhat of a Sherlock Holmes for chronic disease and metabolic disorders.

Founder of theDr.com and visionary behind the renowned online The Gluten Summit. Tom is also the creator of the docuseries *Betrayal: The Autoimmune Disease Solution They're Not Telling You* and is a best selling author, including his critically acclaimed book, *The Autoimmune Fix*.

He holds teaching faculty positions with the Institute of Functional Medicine and the National University of Health Sciences and has trained literally tens of thousands of practitioners, myself included. We are thrilled that Tom joins us today to share with us his advanced understanding of the impact of wheat sensitivity and the link to both fatigue and also the development of autoimmune conditions. Tom, welcome.

Dr. Tom O'Bryan

Thank you so much. It's a pleasure to be with you.

Kirsty Cullen

Wonderful. So we'll get cracking. I know we've got so much to talk about. Tom, you've joined us today to talk about the topic of autoimmunity, as I said, in relation to gastrointestinal health and fatigue. Could you just start by defining for us what autoimmunity is and just tell us a little bit about the scale of the issue globally and really what the future projections are for autoimmune disease development?

Dr. Tom O'Bryan

Oh, my goodness. Yes, of course. I don't think we get argument from any researcher or scientist with the statement that practically every chronic inflammatory disease is a disease of inflammation. The only condition I know of that's not triggering an inflammatory progression is a sodium deficiency causing shrinkage in an area of the brain. There's no inflammation with that one. But aside from that, everything else that I know of is a disease of inflammation as the mechanism by which the disease progresses. By definition, inflammation is an activated immune system trying to protect you. Your immune system is the armed forces in your body. It's the Army, the Air Force, the Marines, the Coast Guard, the Navy. We call them IgA, IgG, IgE, IgM, different branches of the armed forces, but they get activated to protect you.

Historically, we thought when the immune system attacks itself that it is a mistake, a dysfunction of the immune system, we now know that is not the case, that the immune system is going after damaged or polluted cells. For example, mercury often gets stored deep in the nucleus of a cell.

What cell? Any cell, but it's in the nucleus. And when you have elevated ANA antibodies, antinuclear antibodies, well, when you have an elevated ANA, which over 20 percent of the healthy population has, they're supposedly healthy, but their immune systems are attacking the nucleus in their cells, which cells? Any cell, every cell. It just depends on genetically your vulnerability. We know that chemical and food, environmental triggers can activate that mechanism of attacking the nucleus of the cell. Arguably, immunologists have said that ANA antibodies are the most common. Peripheral observational finding. Well, it's never peripheral if you've got elevated antibodies by definition, you're killing off more cells than you're making.

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So let's look at that concept, because I think that's really important. Why is there a reference range from your laboratory when you look for antibodies to thyroid? And the results come back and they say the reference range is 0 to 42 or most labs are somewhere in that range, some are higher, some are lower, but there's a reference range and if you're at 28, you're within the reference rate. Well what does that mean? Antibodies to tissue are killing off tissue. That's the job of antibodies, they're never dormant. They're never not doing their job. If they're in your bloodstream, they're there for a reason. And when you have elevated TPO antibodies, thyroid peroxidase antibodies or thyroglobulin antibodies, when it measures within the reference range it means you're killing off as many cells as you're making. Because we have an entire new body every seven years, some cells are really quick, like the lining of the gut is every few days, some cells are very slow, but every cell in your body regenerates. We used to think heart cells and brain cells did not, but they do. Every cell regenerates.

How does that happen? Your immune system has to get rid of the old and damaged cells to make room for new cells. And the reference range is determined by well, apparently over time, if you're in this range, you're not developing any thyroid issues so that's the normal reference range for antibodies to thyroid. That's how they come up with this over the years. So when you have elevated antibodies, by definition you're killing off more tissue than you're making. So if it's elevated antibodies to myelin, you're killing off more myelin than you're making. If it's elevated antibodies to antigen, if they're nuclear cells, ANA antibodies, you're killing off more nuclear components of your cells, than you're making.

So the question is, why is that happening? And it's happening because your immune system is trying to protect you from something. So anytime you have elevated antibodies, it doesn't matter what tissue it's to, the first thought is why is my immune system trying to protect me? As opposed to, well, let's take some steroids and shut down the immune system. Well, that doesn't work. I've not seen a study enhance quality of life for any rheumatoid patient by taking steroids or any lupus patient or any MS patient enhance quality of life. Of course, these anti-inflammatories are of value in the short term for symptomatic relief. Of course, they are helpful, but they're not the treatment. They're kind of a Band-Aid on an oozing wound.

So we've got to get to why does the immune system have elevated antibodies to myelin? So the way your immune system determines what the antibodies are going to go after is, it looks at the protein signature of that bacteria. And I like to say it's an orange vest. And it's an amino acid sequence of the protein of that bacteria. So the antibodies are looking for orange vests. And once again, it's an amino acid sequence. So it's going through the bloodstream.
Remember, your bloodstream is just a highway. You know, all the traffic's going in the same direction, but there's no lanes, it's not organized, everything's bouncing into each other. So how do antibodies know how to grab on to that particular bacteria? They look for the orange vest and they grab it. Well, the protein signature of the bacteria that the antibodies are trained to look for, that protein signature is very similar to our own human tissue, specifically collagen.

And so if the antibodies are going after a Klebsiella bacterial high concentration in your body, in your bloodstream, that orange vest, the antibodies say, oh, look over there and they'll attack your collagen. That's called molecular mimicry because the human tissue looks a whole lot like the bacterial tissue, right. And you just Google MS and Proteus or MS and Klebsiella or Rheumatoid and Proteus, Rheumatoid and Klebsiella and Professor Ebringer really did such a great job to introduce us to all that. And he's continued to publish on that for 25, 30 years. Study after study after study to where it's

commonly accepted now by all immunologists. And unfortunately, some of our other health care practitioners aren't quite as current in their understanding of autoimmunity.
And so their immediate response, when they identify autoimmunity, is to shut it down, shut down the immune system, take steroids, take whatever medications are necessary to suppress the immune response.

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And I've never seen a study that that approach enhances quality of life. Ever. Certainly it may reduce some symptomatology and it can be a value in the short term to do that. But that's not a comprehensive treatment protocol. That is a Band-Aid on an oozing wound type of... Short term. It's OK to do that short term anti-inflammatories as strong as you need. But if that's all you do, it's like a dog chasing its tail. You're never going to get out of this vicious cycle because you still have the Klebsiella infection or whatever the environmental exposure is that you have.

So if I summarize all of that. An autoimmune response means that you have elevated antibodies to your own tissue. That always occurs because of some environmental trigger. And this is really a great point, our friend and my mentor, Professor Alessio Fasano at Harvard, published a paper last year, and the title is so wonderful. 'All disease begins in the "Leaky gut" '. All disease. And 'The role of Zonulin in the Initiation and Fueling of Chronic Inflammatory Disease'. And Professor Fasano shows us there are five factors, I call them the five pillars in the development of chronic inflammatory diseases, and autoimmune diseases are chronic inflammatory diseases. There are five pillars.

The first one is genetics. Now, the only thing we want to say today, I want to say today about genetics for everyone is that there is no on, off switch for your genes. There are dimmer switches. And what you want to do is dim down the genes of inflammation and ramp up the genes of anti-inflammation. That's the goal. But you never turn them on and turn them off, as far as I know. So stop using that language. Be more specific in languaging. Well, Mrs. Patient, we'd like to dim down those genes of inflammation, which immediately gives your patient the message, their lifestyle will determine if that gene gets ramped back up again or not. Right. Because they've got no control over an on off switch. But if you teach them, they've got complete control over the dimmer switches.

And then number two of the five pillars versus your genes. Second, the environmental triggers. That's the hand on the dimmer switch, is the environmental triggers that ramp up inflammation or tone down inflammation. Ramp up anti-inflammation, tone down anti-inflammation. This is environmental triggers. Critically, critically, it sounds so simplistic. My first mentor, Dr. George Goodheart, would say that the body is intricately simple and simply intricate. Right. So when you think that way, yeah, you can go down the rabbit hole of all of the genes that you're turning on and turning off or ramping up and ramping down with your different activities. But it's the environmental triggers that activate the dimmer switches. And that's food. The most common environmental trigger is what's on the end of your fork? We all know that, right? So that's number two.

Number three, an altered microbiome. The altered microbiome comes from what you put down there. And whether it's food or medications or water or stress hormones or excessive exercise, many of us now have seen the studies on exercise in the microbiome or on foods in the microbiome or stress hormones in the microbiome. And the obvious marker is creating obesity when you encourage more of the bacterial growth to hoard calories. That's where obesity comes from is hoarding calories right. And you don't want a lot of that microbiome. But in any event, our talk today's not on microbiome, but that's number three of the five pillars.

Number four with that dysbiotic inflammatory microbiome, intestinal permeability, the leaky gut. Which allows macromolecules to go through the walls of the intestines into the bloodstream, activating number five, the systemic immune response. Trying to protect you from whatever it is that got in through the intestinal permeability. Whether it's bacteria or lipopolysaccharides or foods, that your immune system trying to protect you, now here comes the antibodies going after Klebsiella. And because of, there are four factors, but the main one is molecular mimicry because of these mechanisms of the antibodies trying to identify the threat. You can begin attacking your own tissue. That's the development of autoimmune diseases.

Kirsty Cullen - [00:15:49]

And it explains it so clearly. I know you've said previously, Tom, I've definitely heard you say, that the autoimmune process can be arrested, if you will, if the gut barrier function is re-established. And then we can kind of prevent that interplay between those environmental triggers and genetics.

Dr. Tom O'Bryan

Exactly right. That's exactly right. And the language, the exact language, because I've read the study on stage so many times, is you can arrest the development of autoimmune disease by healing the gut. Not just correcting the permeability, but healing the gut, which means the microbiome. Because the microbiome creates that inflammatory environment that causes the permeable, excess permeability. Right. So if there were one takeaway, just one takeaway, on what do I do with autoimmunity? Heal the gut.

Kirsty Cullen

And you talk about a threshold, don't you? Talk about how every individual is impacted by wheat and how that might be transient to begin with, but effectively with repeated exposure, there is essentially eventually a threshold that we all have the capacity to cross. Do you want to say a little bit more about that?

Dr. Tom O'Bryan

You bet. You bet. Professor Maureen Leonard, famous gastroenterologist at Harvard, did a literature review in 2017 of gluten and intestinal permeability. I think there was 64 studies that she used, she looked at a whole lot more, but she narrowed it down to 64 studies that met the criteria. And the summary was that all individuals who ingest gluten develop transient intestinal permeability. Her language was, "this occurs in all individuals who consume gluten". So if anyone here listening to this interview falls under the category of an individual, a human, if you're human, this happens to you every time you consume gluten.

Now, the key word here, in her summary, is 'transient', intestinal permeability. Mrs. Patient you have an entire new body every seven years, every cell in your body regenerates the fastest growing cells of the inside lining of your gut every three, four days, something like that. So you do something that causes a tear in the gut. It heals. You have a sandwich for lunch. You tear the lining of the gut, it heals. You have pasta for dinner, you tear the lining of the gut. It heals.

But as we all know, you change your microbiome in twenty four hours by what you eat. It doesn't take weeks and months and months to begin changing the direction of a microbiome. If there is a measurement of how much inflammation is in your gut, and there are some stool markers you can use for that, but they're not really sensitive. They're pretty gross. I mean, they're helpful. If you're elevated, you got a problem.

But if we could imagine a high quality stereo system with big speakers all around and you just turn that switch just a little bit and the volume goes up substantially and you turn it a little more and the volume goes up even more and you turn a little more. And there's going to be a point where you say, all right, that's loud enough for me, but you turn a little more and now it's louder than you're comfortable with. That's transient intestinal permeability. And you turn it up a little more and it's even louder. Now you're like kind of awkward fidgeting, not really comfortable listening to the music. And you turn up a little more and now it's like, I want to get out of this room. When you transition from transient intestinal permeability to pathogenic intestinal permeability, you've lost tolerance. You can't tolerate this anymore. You can't heal fast enough. You're tearing the lining faster than you can heal. That's a loss of oral tolerance. And that is the prerequisite to pathogenic intestinal permeability.

Remember, intestinal permeability is not bad for you. We would never absorb any of our nutrients unless we had a permeable gut. But the slang term 'leaky gut' means you've gone up way too high in the volume and there's too much coming through now and you can't heal from it. That's the premise from which some of our well educated experts in this field still eat dinner rolls. I go out to dinner with

some of our world famous people and they're eating the rolls, putting some butter on. I go Alessio! What. And he said haven't lost tolerance. Right. And so OK, OK, I understand that. I understand. But you're playing with fire. You remember the Rolling Stones song 'Don't Play With Me Cause You're Playing with Fire'? That's gluten, right. This happens to every individual. And if that were the only insult to your microbiome, you'd be fine. I don't think any of us would have the problem. I don't think our ancestors suffered as frequently with problems of wheat as we do today.

[00:21:40]

So why are we losing tolerance? The Journal of Pediatrics came out with a policy statement. Now, arguably The Journal of Pediatrics is one of the most prestigious medical journals in the English language for children's health, (see American Academy of Pediatrics). And when they publish a policy statement, that's not coming from an author or some research, this is a message from the board and they want to make sure that every pediatrician hears this. And they said that the Toxic Substances Control Act, which is the legislation at the federal level in the U.S that regulates the introduction of chemicals into our environment, the Toxic Substances Control Act failed miserably to protect our children, pre-teens and adults. And they said it's 27 trillion pounds of chemicals manufactured or imported in the United States every year. And I don't know the number in Europe or Great Britain, but I'm sure it's similar in magnitude.

Now, that number doesn't mean anything to me. What's the difference between a million or a billion or a trillion? I don't really resonate to that. So I took 27 trillion. I divided it by 365 days and I divided that by the number of, the population of the United States. 340 million, whatever it was. It comes out to 247 pounds of chemicals per person per day. And that would be, I guess that's about 100kg or so per person per day, every single day of chemicals being manufactured or imported into the country. And we've all heard that every newborn child has at least 200, one study said 280 chemicals in their bloodstream that aren't supposed to be there, every newborn child. Over 200 chemicals. A recent study of 280. They're not supposed to be there. Why? Because mom is a walking sewage dump. Excuse me for being blunt. I'm hoping that I'm reaching a lot of women of childbearing age here today. And I need to be blunt with you. It's like, wake up, wake up.

The incidence of autism is going through the roof exponentially. And Blue Cross Blue Shield, perhaps the largest health insurance company, for-profit company in the English language, certainly United States, multibillion dollar company. They published last year that between 2013 and 2017 in four years, there was a 406 percent increase in the diagnosis of Alzheimer's in 30 to 45 year olds. 406 percent in four years.

We have to wake up to the pandemic that's impacting on all of us every day at a subtle level, and that is the amount of chemicals in our body that take us over the edge of tolerance. So it's not the wheat, but it's the environment and the microbiome that gets created with GMO foods and glyphosate that kills off the probiotics and encourages the growth of more pathogens. And the antibiotics that are sprayed on vegetables and we're eating the vegetables in a nice restaurant. We have a nice big salad, looks beautiful. But they bought their vegetables from the local market and they were sprayed with antibiotics a week before they were harvested and you're getting minute doses of antibiotics that are killing off your probiotics. Right.

So this whole world that we're involved in of exposure is taking us over the edge of tolerance. That's the critical thing here. It's not the wheat because everyone develops transient intestinal permeability, but you heal. Fastest growing cells inside lining of the gut every three to four days, you just heal. But when there are so many other triggers causing the inflammation of the gut, because these triggers are altering the microbiome and to do justice for our psychiatric friends out there. We live such high stress lives and the amount of stress hormones that we're producing on a daily basis is magnitudes more than we're supposed to be. And the result of that, we all know about hypoadrenia, low functioning adrenal glands are just worn out and all that. But you change the microbiome with the more stress hormones you produce.

So that's another contributor. It's not just the food. It's not just the lawn spray or the phthalates in the indoor air from plastic everywhere. There are so many different triggers that we're exposed to. It takes

us over the edge of tolerance with wheat. That's why when you do a thorough, accurate test for wheat related disorders, 8, 9 out of 10 people come back positive with elevated antibodies to different peptides of wheat. That's why it's happening. It's not the wheat. Well, is it the GMO in the wheat? No, this started long before that. And of course, the GMO makes it worse. It adds more fuel to the fire. Well, is it the hybrids? Well, yeah there's more gluten and tougher to digest that's true. But that's not it. It's rather the entire environmental world that we're exposed to that's creating our loss of tolerance. We've gone over the edge, creating intestinal permeability, five pillars in the development of all inflammatory diseases. And where we have most control is the environmental triggers, rebuilding a healthy microbiome and correcting intestinal permeability. You can't do one. You've got to do three to calm down the systemic immune response is just trying to protect you, your autoimmune diseases, your immune system, trying to protect you. Well, the question is, what's it trying to protect you from?

Kirsty Cullen - [00:28:32]

It's obvious, isn't it? The results are obvious. I know another statistic that you've used previously is that at the turn of the 20th century autoimmunity was found in 1 in 10,000 individuals, and now we're down to 1 in 4 on the autoimmune spectrum, which is just such a rapid surge.

Dr. Tom O'Bryan

Yes, yes. And the question has to be asked is why? Why is this happening? Well your immune system is trying to protect you, your immune system hasn't gone crazy. You're just being exposed to so many things that your ancestors were never exposed to. Every person that's tested for phthalates has phthalates in their blood, phthalates in their urine. Those are the chemicals used to mold, plastic. Every single human. Even the Eskimos, they all do. Right.

But we don't have any defense mechanism against phthalates and here's just one example. Just Google phthalates and thyroid, and you will see that phthalates bind on to your thyroid tissue and then your immune system, trying to protect you goes after that neoepitope, one of the four triggers for autoimmunity, molecular mimicry, neoepitope. The immune system goes after the neoepitope to kill that thing. What is that thing there? That's not thyroid. And when you go after that neoepitope, you now have damaged the thyroid component of that thyroid BPA molecule. So you've damaged the thyroid components. Now you have to make more thyroid antibodies to get rid of the old and damaged thyroid cells. But you keep drinking water out of plastic bottles or you keep inhaling the air in your house that's high in phthalates and so that keeps binding to your thyroid, if that's your genetic vulnerability, and then your immune system trying to protect you keeps going after this foreign molecule, this neoepitope and trying to protect you, going after it. Attacking the neoepitope damages the thyroid component of it. And you make more thyroid antibodies to get rid of the old damaged thyroid cells. Eventually you get Hashimoto's. Just Google BPA and thyroid and you'll see it, you'll read the studies.

Kirsty Cullen

And that kind of brings me neatly to the connection between autoimmunity, the impact on fatigue and how autoimmunity is relative to chronic fatigue. Because, of course, we see inflammation. We see toxic burden within sort of the CFS community. We're constantly testing within our community and seeing viral and bacterial and environmental and toxic factors. And those obviously act as potential triggers for inflammation and immune activation, which then perpetuate the CFS related symptoms. Would you agree with that?

Dr. Tom O'Bryan

Oh, absolutely. Absolutely. That is a, perhaps the, primary mechanism in the development of these chronic fatigue situations that we've got. Arguably, there's a good argument that the most common symptom of a food related sensitivity is fatigue. That people think, well, I don't feel bad when I eat... And what are they using as a criteria as to whether they feel bad or not, their stomach, their digestive tract? Well, we know that for every one person that gets gut symptoms with celiac disease, there are

eight that don't. They get brain symptoms or joint symptoms or skin symptoms. So if your determinant criteria of whether a food is good for you or not, is does my gut hurt when I eat it? Or do I get diarrhea or constipation when I eat it? Does it affect my gut? You'll catch one out of eight and you'll miss seven out of eight. So arguably the most common symptom is fatigue.

Kirsty Cullen - [00:32:28]

And what are those other symptoms, Tom? Because I know clinically I speak to a lot of people who, as you say, they're reluctant to exclude wheat or gluten from the diet because they don't make that sort of perceived link between eating wheat and having sort of gut issues. Along with fatigue what are some of the other common symptoms that you would say we should be looking out for?

Dr. Tom O'Bryan

Oh, one of the great pioneers in this world of wheat related disorders is Dr. Rodney Ford from Christchurch, New Zealand. And he had the courage back in the 80s and 90s to be talking about non-coeliac gluten sensitivity and wrote a couple of books on it. And we shared the stage many times. He's a wonderful man. And he had such a great answer to that specific question. We were sitting on a panel on stage and the audience was asking questions about 400 or 500 people and two microphones, one in each aisle and lines of people, and they go mic to mic. And so somebody asked, what are the common symptoms if you're having a problem with wheat? And I just said, Dr. Ford. Right. And he looked well... And he's a very serious pediatric gastroenterologist. And he said, well, when people come to me and what makes me think of checking them for a sensitivity to wheat is if they're sick. So if they have joint pains, they're sick. If they're tired, they're sick. If they have headaches, they're sick. If they have a skin problem, they're sick. So anyone who is sick, you consider is wheat a trigger for that? So that's the best answer I ever. I was just laughing and I high fived him because he's right on the money.

There is no tissue of the body that is not susceptible to dysfunction because of increased inflammation. There is no tissue in the body. And I'm doing a presentation tomorrow that I've just finished up case studies on. Neurological complications of wheat related disorders. And I've got five studies in there on reversing lesions in the brain, on a gluten free diet. Pre and post MRI's or children with drug resistant epilepsy, meaning they've tried at least three medications and nothing's working to qualify for that diagnosis. 50 percent of those children go into complete remission on a gluten free diet. And they've been to two, three neurologists already. And you put them on a gluten free diet, 50 percent of them have no more seizures on a gluten free diet, because for some people, and it turns out to be a lot larger proportion of people, when they have a wheat related disorder, they have slowed biphasic EEG, so your brainwave patterns are just a little bit slower than they should be. Well, that's brain fog and that comes from wheat. So what symptoms do you look for? Any symptoms. If your approach is not getting the job done that you want, always consider first on the list, after everything else you've tried, wheat.

And eventually what happens it's the first thing on your list that you check for instead of after everything else has failed because you'll see it so often.

Tumors in the eye completely reverse on a gluten free diet. Just read the science and case studies are jaw dropping when you see them. Severe arthritis, in a wheelchair for 20 years. In 10 months, their pain's all gone and they're walking again on a gluten free diet. I mean, it doesn't matter. Severe psoriasis, severe. In 30 days, completely gone on a gluten free diet. It doesn't matter what the symptoms are. We have to understand the five pillars and what's the environmental trigger that's activating this whole inflammatory cascade. And wheat is a very common trigger to that.

Kirsty Cullen

And aside from wheat then, how else do we position the diet with autoimmunity and gut health and fatigue in mind?

Dr. Tom O'Bryan - [00:36:57]

We always start our patients wheat free, dairy free, added sugar free. We start there. And they should notice that they're feeling better within three weeks. I don't care what they've got. Something should be doing better. They're sleeping better. Their energy is up for part of the day. They should notice some improvements. If they don't, then we'll take grains out for a few weeks, completely. And if that doesn't do it, then we look to some of the other tests or lectins.

Lectin sensitivity can be really common. We've already done wheat, we've already done dairy and sometimes corn. 50 percent of celiacs if you keep eating corn, you'll still have wheat antibodies, even though, because of the mimicry between corn proteins and wheat proteins. So you have to play detective sometimes. But, you know the rule of thumb, when I came out in practice, this was 1980. I opened my practice on Valentine's Day in 1980, and I had already heard this statistic and I just didn't believe it. But it's 80, 10, 10. Your best efforts. 80 percent of people get better. 10 percent don't. 10 percent get worse. When you include wheat related disorders as a primary investigative tool your success rate goes up to 92, 93 percent across the board with most everything because it's so very common that we've lost tolerance to this thing that causes transient intestinal permeability. It's not transient anymore because the microbiome is so far out of balance from years of exposure to all these environmental toxins.

I know I'm giving you a really big picture concepts here, and I'm repeating it because I'm hoping you'll just kind of wrestle with these ideas and read a few papers on it for yourself and say, this just makes sense. I need to focus on rebuilding the microbiome. Right. I'm hoping that will occur out of this talk.

Kirsty Cullen

And one final question, Tom. Obviously the diversity of the gut microbiome is key, it's central to health. We know that. And where there are certain food restrictions within a diet, whether that be sort of fodmap based foods or sort of wheat or gluten or what have you. How do we protect the diversity of the microbiome still within what remains in the diet?

Dr. Tom O'Bryan

That's a really good question. You have to educate the patient that every day they put this much attention on feeding the microbiome, which means prebiotics and probiotics every day, not taking supplements. You certainly can support enhancing the environment by taking supplements, but we have to teach every single patient to realize they were never taught how to feed their microbiome, they just don't know. They don't have a clue, they don't even know what it is. Right. So we have to come up with our own little. "Hi, it's Dr. O'Bryan. I just want to talk for a moment on how do you increase the good guys in the gut?" And there are certain, we just do these little two minute videos and we send them to every patient on our list. And when the patient comes in, Mrs. Patient, Kathy is going to email you a video I did on the balance between the microbiome, the bacteria that hoard calories and the bacteria that don't hoard as many calories. And that's really important when you're concerned about weight. You said you're concerned about weight and it's called the bacteroidetes firmicutes ratio. And that's really geek stuff. But I did a little video that will explain it to you. And here's the vegetables you use to help feed that so that you don't hoard and store so many calories. We have to educate our patients about this. You can't give them a prescription to take some powder that they throw in their smoothie for prebiotics, which is a good idea to help get them over the hump, but it's lifestyle education that will make the difference in the long term.

Kirsty Cullen

I completely agree. Tom it's been fascinating to speak with you. Where can people go if they want to find out a little bit more about work?

Dr. Tom O'Bryan

Oh, thank you. Our website's, thedr.com. And we've got videos and handouts and all kinds of things there for you.

Kirsty Cullen

Great. Well, thank you so much again for your time today and sharing your knowledge with us.

Dr. Tom O'Bryan

Thank you. It's a pleasure.