



Microbiome, Gut Health & Arthritis

Hosts: Rebecca Gillett, MS OTR/L, and Julie Eller

Guest: Arthur Kavanaugh, MD, and Monica Guma, MD

Scientific evidence linking gut health and arthritis, as well as a slew of other diseases, continues to grow. Research has successfully connected the gut microbiome — the ecosystem of trillions of microorganisms inhabiting the digestive tract that can help stabilize the immune system — to rheumatoid arthritis (RA), psoriatic arthritis (PsA), ankylosing spondylitis (AS) and lupus nephritis. In this episode, we explore the microbiome-arthritis connection, including its effect on inflammation. We'll also discuss proven strategies to help improve and maintain the microbiome balance. When the microbiome is out of balance — generally from illness, poor diet, antibiotics, smoking, stress or obesity — the immune system can also get out of whack.

Our guest experts are Arthur Kavanaugh, MD, and Monica Guma, MD.

Dr. Kavanaugh is a professor of medicine, and Director of the Center for Innovative Therapy at University of California, San Diego. The Kavanaugh Lab conducts clinical research in lupus, rheumatoid arthritis, ankylosing spondylitis, gout and psoriatic arthritis. Dr. Kavanaugh received his medical degree at St. Louis University, School of Medicine, St. Louis, Missouri. And completed his internal medicine residency, and allergy immunology fellowship at Baylor College of Medicine in Houston, Texas.

Dr. Guma, is a rheumatologist and researcher at the University of California, San Diego. The Guma Lab studies metabolic changes in cells critical to the way that rheumatoid arthritis and psoriatic arthritis develop. Her work includes clinical investigations to identify biomarkers that identify patients that at high risk for joint damage.

Additional Resources:

Download the accompanying [eBook: The Benefits of Good Gut Health](#) for a chart, shopping list and sample menu to explore and get started on the ITIS diet. You can also download a [mobile-friendly version of the grocery shopping list](#).

[Read this article](#) for more information about the IT IS diet. Check out this article on [The Ultimate Arthritis Diet](#).

Tune in to other [nutrition-related podcast episodes](#).



EPISODE #27 – MICROBIOME – CLEAN TRANSCRIPT – 1/9/2021

PODCAST OPEN

Welcome to Live Yes! With Arthritis, from the Arthritis Foundation. You may have arthritis, but it *doesn't* have you. Here, you'll learn things that can help you improve your life and turn No into Yes. This podcast is part of the Live Yes! Arthritis Network — a growing community of people like you who really care about conquering arthritis once and for all. Our hosts are arthritis patients Rebecca and Julie, and they are asking the questions you want answers to. Listen in.

Rebecca Gillett:

Welcome to the Live Yes! With Arthritis podcast. I'm Rebecca, an occupational therapist living with rheumatoid arthritis and osteoarthritis.

Julie Eller:

And I'm Julie, a JA patient who's passionate about making sure all patients have a voice.

MUSIC BRIDGE

Rebecca:

Thanks for joining us on this episode of the Live Yes! With Arthritis podcast. Today, Julie, we are talking about the microbiome in arthritis.

Julie:

That's right, the microbiome. We're getting microscopic with our conversation today. (laughter) We're not just talking about your arthritis or your joints. We are zooming in on gut health and how the microbiome makes an impact on how we experience our arthritis.

Rebecca:



Yeah. So many people talk about it or are addressing it or changing their diets around it. (laughter) Or talking about, "Should I take probiotics? Is this good for me?" There's so many questions, I think, more than there are answers. And a lot of that has to do with the research that is being done, thankfully. But really not a whole lot that has evidence to help guide us. So, hopefully in this episode, we have two guests who can guide us through understanding our microbiome and its effects. And then what little changes, or things that we can do, maybe, to change our diet that might help us out.

Julie:

We are so glad to have our first guest today, Dr. Arthur Kavanaugh. Dr. Kavanaugh is a professor of medicine and director of the Center for Innovative Therapy at UC San Diego. The Kavanaugh Lab conducts clinical research in lupus, rheumatoid arthritis, ankylosing spondylitis, gout and psoriatic arthritis. Dr. Kavanaugh received his medical degree at St. Louis University, School of Medicine, St. Louis, Missouri. And completed his internal medicine residency and allergy immunology fellowship at Baylor College of Medicine in Houston, Texas, followed by a rheumatology fellowship at UT Southwestern in Dallas. Dr. Kavanaugh, thanks so much for joining us today. We're excited to talk to you about the microbiome.

Dr. Arthur Kavanaugh:

All right. Thanks for having me.

Rebecca:

To kick us off, can you just tell us what is the microbiome? And I know a lot of people use microbiome and gut interchangeably, but that's not correct. So, can you enlighten us?

Dr. Kavanaugh:

Well, the microbiome is the aggregation of different microorganisms that kind of share our space. You could think of humans as being kind of a spaceship, and there are quite a number of passengers. And, we often think of microbiome, and focus on it in the gut, which is a very rich and diverse collection of bacteria, fungi or viruses,

But we also have microbiomes pretty much throughout the body. So, you will have different microbiome on your skin. The same with mucosal surfaces, the same with the



respiratory tract. So, all of those are areas in which we share our space with a whole variety of other organisms. And, in fact, if you counted them up, there are more of them than us.

Julie:

That's helpful to think about, that there are all of these little passengers on our spaceship. Can you talk about how the microbiome affects different aspects of health?

Dr. Kavanaugh:

We have known about the microbiome for some time, and it's really notable that we've only paid a lot of attention to it much more recently. So, I think for doctors of a certain age, we knew back at that time that one factor you had to be careful of was whether or not people used antibiotics. And it was known that a good amount of vitamin K that we are able to obtain comes not from the diet, but from the synthesis from the gut microbiome.

So, if you had a patient who took antibiotics, and you killed a bunch of bacteria that were making some vitamin K for the host, all of a sudden the blood would be thinner than it should have been with all other factors being equal. So, that, I think, is for me one of our earliest observations on the gut microbiome, certainly.

We hadn't paid so, so much attention to it until recently. Partly because, I think, the techniques of identifying the microorganisms are something that has had tremendous progress lately. And therefore, we can identify things that were hard to just culture.

You don't just necessarily culture things from deep inside the gut. They don't do very well when you try to grow them in the laboratory. We were not aware of them. So, recently the interest in the microbiome has really taken off due to the progress in techniques to be able to identify the diversity of organisms there.

Rebecca:

What we are learning from some of the research is that certainly the health of our microbiome can affect all other aspects of our health. How does that relate to arthritis?

Dr. Kavanaugh:



Unfortunately, the short answer is that we do not know precisely. There has been some very nice work from investigators across the world in a number of laboratories who have looked particularly in patients with arthritis to see if there can be some relationship between the different microorganisms that we have, and changes in the microorganisms, and the development or the outcome of people with arthritis.

One difficulty with the microbiome is the whole chicken and egg debate. So, did the changes in the microbiome occur, and therefore predispose to arthritis or changing disease activity? Or did the arthritis change the immune system and result in changes in the microbiome?

That, as you can imagine, is incredibly difficult to sort out. One would need to do some studies, some of which are underway at many universities around the country, to follow people longitudinally. And ideally follow people, for example, before they developed arthritis and look at changes in their microbiome and see if maybe they heralded the development of arthritis, or did they just reflect the development of arthritis, which changes the immune system, and therefore it can have an impact on the microbiome.

We don't have anything right now to say, "Well, you better watch out for this bug, because it's very bad." And it's also quite complicated. It's not just the presence or absence of a single bug. I think one way you may think about it: It's like a battlefield in there. Bugs are sometimes against each other, and sometimes they come to a bit of a draw. And if you disrupt that by, say, an antibiotic or abrupt change in diet or the development around the disease, then maybe one of the groups of bugs gets the upper hand, and that may be important for diseases.

Julie:

It's hard to think about the minuscule factors that can have an impact on your health when you really consider the microbiome being a part of the health of one or two or three or four organ systems. That's really important to think about: how each has a cause and effect. I wonder, can you discuss a little bit how behavior changes can affect the microbiome and what you can do to take control of this part of your body's health?

Dr. Kavanaugh:



Well, the nervous system interacts in ways that are increasingly complicated with the immune system, both the specific parts of the immune system and the so-called innate parts of the immune system. And we've known for a very long time that people will often say that stress makes their arthritis symptoms worse. And if you see enough patients over enough period of time, I think you know that that certainly can be the case.

Rebecca:

What about any medication use? Should patients think about minimizing their use of antibiotics or if they have to be on it? Is there something that they can do to not impact their microbial health as much?

Dr. Kavanaugh:

I think that's an important point to discuss. Everything you would say now is antibiotics are bad, bad, bad. But it also has kept humans alive for many decades longer than all of us used to live before we had antibiotics. Because people would get infections and die as a result of the infection.

So, I would certainly never suggest don't take antibiotics because it'll upset your gut while you're dying of pneumonia. It's all about the balance. I think many people now are aware that you want to try to minimize the use of antibiotics. But, of course, they're lifesaving in many circumstances. So, it's really all about the balance.

Julie:

Especially with folks who deal with immunosuppressive medications that they use to treat their arthritis. Especially when I was a kid would get sick quite frequently with my juvenile arthritis, and then have strep throat or a sinus infection that would require a course of antibiotics.

And my mom would always say, "OK, let's do the antibiotics, but also you're eating yogurt for a week. We've got to re-replace some of those microbiome losses." Is there validity to that? Are there things we can do in addition to antibiotic use that can help balance your microbiome?

Dr. Kavanaugh:



I wish there was something that was very simple like that. Yogurt is great. And there are people who have, for example, disruption in the balance of the bacteria in their gut and have diarrhea, and yogurt and probiotics can help restore that and make it better.

But I don't mean to suggest that you got your arthritis because you weren't eating enough yogurt. Or, if you eat more yogurt, you wouldn't need your new TNF-blocking medication, which is helping your arthritis. So, the diet, there's certainly something very important to it, but not enough to make a specific blanket recommendation across individual patients. So, you know, eating good food certainly makes sense. But it's sure hard to pinpoint anything, to say everybody ought to avoid, other than perhaps being out of balance.

Julie:

And what do you mean by being out of balance?

Dr. Kavanaugh:

Well, if you ate nothing but yogurt, you probably get some other problems.

Julie:

(laughs) So, really working to have a well built and balanced nutrition plan. That's helpful.

Dr. Kavanaugh:

Yes, absolutely. But I don't want the flip side. I don't want people to think flip side like, I developed arthritis because I ate too many potatoes or tomatoes. You don't wanna be misinterpreted and say that I missed the boat on this and that's why I got arthritis.

Rebecca:

Yeah, I think people are often just trying to find if there's any little thing they can to control their arthritis. If this is something I can control, then maybe I can change what I put into my diet.

Julie:



Dr. Kavanaugh, can you talk about some things folks can do if they have skin involvement with their disease?

Dr. Kavanaugh:

Well, skin is a little bit trickier. The skin conditions are quite different one from the other. So, psoriasis is a condition where there's immune activation of the skin, and skin gets thicker and scaly. Importantly, even if patients have really very active skin, they don't get cellulitis or infection of the skin.

So, the barrier function of the skin is intact, the immune system in the skin is intact, and perhaps even revved up. Treating psoriasis with an eye toward changing the skin microbiome, there's not data to support that, and I'm not sure that there would be.

On the other hand, if you have atopic dermatitis, that condition is characterized by a bad barrier function, partly genetic, of the skin, and super infections are incredibly important. That's why patients with severe atopic dermatitis, there is attention directed toward treating the skin with antibiotics or with bleach baths, for example, because the infections help drive the activity of that particular disease. So, with skin it really depends on the condition.

Many people will avoid gluten, and even if the tests for the insensitivity were never positive, if they feel better with it, that may be something unrelated to strict immune gluten sensitivity, but it's still maybe important for them. If they feel better, that's a real thing. And that may well be because, somehow, avoiding those foods has changed their microbiome.

Rebecca:

That's a good way to look at it. Because some people like me, I've been tested, I don't test positive for gluten sensitivity yet. I know I feel better when I eat less of it. So, this brings me to another question for you. People will say, "Well, I'm going to detox and change my diet, and eat all of the things that are good to improve my microbiome. But then I fall off the wagon and I don't sustain that. To really affect your microbiome, this is more of a lifestyle change versus a diet. Would that be correct to say?"

Dr. Kavanaugh:



Yeah, like all diets, I think the problem with dieting is that you're dieting and all you do is think about food. (laughter) If you start counting calories, you can't help but get hungry, 'cause you're just thinking food, food, food. So, it is more of a lifestyle change.

Julie:

That's really helpful, Dr. Kavanaugh. Thanks for walking us through so much about the microbiome. If you wanted to give our listeners three key takeaways about arthritis and the microbiome, what would you want them to walk away from this conversation with?

Dr. Kavanaugh:

Well, keep an eye on the developing information. We're learning more all the time. Recognize that it's not your fault. You didn't get arthritis because you didn't eat enough yogurt. (laughter) I actually heard and read some people saying, avoid nightshade vegetables and you don't need your arthritis treatment as much as anti-inflammatory diets. Very interesting. Take those kinds of things with a grain of salt, no pun intended. (laughter) ... because, you know, we've come so far otherwise in the treatment of patients with arthritis and getting them so much better than we had years ago.

Julie:

Dr. Kavanaugh. Thank you so much for joining us today.

Rebecca:

Yeah, thank you very much.

PROMO:

Want to connect with others who understand what you're going through? The Arthritis Foundation's Live Yes! Online Community features forums on specific topics, where you can chat with those who know what it's like, including health care experts. Or check out our local virtual Connect Groups for a more personal touch. Sign up at www.arthritis.org/LiveYes.

Rebecca:



Now that we've learned a little bit more about the microbiome to understand how it might affect our arthritis, Julie, I think the next thing we need to try to learn about is: What can we do about it? How can we change it? Does diet make a difference? And what's the science say? So, excited for our next guest.

Julie:

Yeah, definitely. Dr. Monica Guma is a rheumatologist who practices at UC San Diego. The Guma Lab studies metabolic changes in cells critical to the way that rheumatoid arthritis and psoriatic arthritis develop. Her work includes clinical investigations to identify biomarkers that identify patients at high risk for joint damage. We are so excited to get in the weeds with Dr. Guma today. Dr. Guma, thank you so much for joining us. We're so glad to have you here.

Dr. Monica Guma:

Thank you so much for the invitation.

Rebecca:

Tell us a little bit more about you. What started your interest in studying the diet and the microbiome in people with inflammatory arthritis?

Dr. Guma:

My lab focuses on metabolic changes and circulating metabolites that can impact inflammation. So, we know there's a lot of research data suggesting that these metabolites can shift, can change the immune response, can maybe change the pain perception.

What is important to change the metabolites in the circulation, one main thing is diet. Probably 60% or 70% of the metabolites that we have circulating in our body comes directly or indirectly from diet. But then the other piece that is actually very important is the microbiome. Because, depending on how the microbiome will use the ingredients that you are eating, then you will get A, B or C metabolites in the blood.

So, basically, it's very difficult to try to understand what happens in the circulation without understanding diet and microbiome. **That's why** I started with inflammatory arthritis because my research has been always focused on inflammatory arthritis.



Julie:

That's exciting to think about, that this is so robust an area, that it's something that you can dive in and really dedicate your studies to. Rebecca and I talk about this a lot on our podcasts. Patients are looking for things that they can control, and diet is something that they can control.

You can't always control how your joints are going to feel in the morning, or how long you're *stiff*, or, you know, what you might have to give up that day to accommodate for those lacking spoons, but you can control your diet.

Dr. Guma:

Some patients really want something quick, and they know that changing diet is going to be an effort. Some of the patients that we approach, they say, "No, no, no, I really want the option of the treatment. Of escalating or changing treatment." But other patients, as you said very well, they don't want to increase a pill. They really want to do something themselves, and these are the ones that they are super motivated to change diet. And that's why we got very good feedback about our trial to recruit patients.

Rebecca:

It really has to be a different frame of mind if you're going into this versus just, "I'm gonna tweak a few things and that's it." It really is more of a lifestyle change. I had listened to a rheumatologist talk about diet in one of our Connect Group meetings last year. And she equated it to ... because people kept asking questions about probiotics and prebiotics ... and she said: "Let me put it this way, the more diverse that you eat, the more diverse your microbiome is." And she showed us a picture and said, "If, you're only eating one thing, and then you all of a sudden introduce a new thing for a little bit, it takes time for that to build up."

So, she showed a picture of a forest with a palm tree in it, and she said, "If you're gonna take probiotics (laughs), and then you eat all those other things that aren't necessarily good and part of the anti-inflammatory type diet, you're really not doing anything. That palm tree is not gonna last very long." And so, it was a great visual for me to understand that it's not just a one-time fix, it's what you do over a longer period of time. I



think what you just said really speaks to that. It's not just a quick fix. It's you really have to be dedicated to wanting to really change your lifestyle of eating.

Dr. Guma:

Microbiome is really quite fixed in adults. We don't have a lot of data about how long a shift from the microbiome will stay, because there is a lack of longitudinal studies. We know that sometimes, some kind of like an intervention can shift the microbiome to a, in theory, healthier microbiome. But it probably won't last very long, especially if you don't do other things. And these other things can be sleeping better, exercise ... there is a lot of things.

It goes together with the results of our diet trial. Not everybody responded in the same way. And that probably is because of the already fixed microbiome that they've had from the beginning.

If somebody has more diversity on what they eat, the microbiome is considered healthier. But again, there is no strong evidence that somebody that now is 50 years old and change completely that diet, and that microbiome shift is going to stay really, long. But if you are giving better ingredients to the microbiome, at least you can hopefully get the best metabolites, or the best quality outcomes that will improve your disease.

So, again, a balance between ingredients, microbiome and metabolites could probably shape the immune response, or would probably modify the pain, for instance. Maybe we cannot really change everything in all the patients, maybe we can change something that will help them improve.

Julie:

That's really helpful. So, we can make modifications to the forest, but the forest is going to be something we really have to nurture for a long, long, long time before we see full microbiome results. It's helpful to hear a little bit about your research and some of the ways that you understand more about the microbiome. Would you mind giving us an overview on the study that was presented at the 2020 American College of Rheumatology conference? And tell us a little bit more about the ... Is it the I.T.I.S. diet or the "ITIS" diet?



Dr. Guma ([00:38:28](#)):

ITIS is a suffix that means inflammation. It's like a free diet. Maybe 'cause it would be a diet free of inflammation. But at the end, when we talk and it's easier to say ITIS diet, because it's more like a colloquial.

Basically, that study that we presented was a pilot trial with only 20 patients and no placebo group. So, it was just a proof of concept. I think that patients with arthritis, they have so much pain, and so much functional disability and issues. So, they have a lot of knowledge, but even though with that knowledge, they actually ... they also had this question.

The idea was the first year, we've basically built this diet. Trying to put ingredients that were easy to cook. Like it was feasible, you know. Maybe it's easy to make a smoothie in the morning. Maybe it's more time, but you can add vegetables and fruits. Maybe it's easier for that patient to eat that and have a lot of antioxidants than to tell them: Eat a salad every day. Maybe it's very boring and they won't do it.

So, we spent this year first to build what we thought was a feasible diet, getting all the feedback from our patients. And then the second part was the trial itself. We had a very good motivation, patients really followed the diet. It was a short trial, it was only two or three weeks of diet. And the adherence was very good. It was easy for them to follow. Of course, it was short. The response was around 50, 60%, a good response. All of them, they could feel more energy and better because they were taking care of themselves and changing diet. They were having almost no pain or no swelling.

We were not changing the standard of care treatment. They were continuing their treatment. We didn't stop anything. But even if they didn't stop anything and they had the disease more or less controlled, they always have this pain out of 10, I don't know, three or four out of 10. They always have three or four swollen joints, not enough to escalate the therapy, but they are always there.

So, we had that as a baseline, and some of them, they actually went into remission, and they were so happy. Some of them, they didn't change the score. Not everybody will respond at the same extent.

Julie:

Right.



Dr. Guma:

And we observed some differences in how the microbiome was at the beginning, how the microbiome was later. Either patients were able to change under the microbiome the metabolites in the blood. We don't know still enough to anticipate the response, to predict the response. We have to run a large trial, OK? But some of the messages that we wanted to get from this trial and discussion with our patients were clear. Is a feasible diet if it works well, but not at the same extent for all our patients. And that, of course, maybe it's a little bit discouraging for some patients, but at the same time, it's more honest and more real. It's like the same as the drugs that we suggest to the patients. They won't be perfect for all our patients.

Rebecca:

Yeah. So, then your research is really kind of reinforcing that the diet isn't a treatment option for autoimmune diseases, even though it does affect our gut health, but it is an option to treat our symptoms and our pain.

Dr. Guma:

For most of our patients' diet, it needs to be seen as something that is a complementary thing that you can control. And that probably will help to improve, even to get into remission or decrease the amount that you need to take because of the pain. Or maybe at some point to help the doctor to de-escalate a little bit the medication.

In the first two years, a goal is to bring the patient into remission. That's our guidelines. We push, push, push, and we add, add, add medication. And then after one or two years, we really hope that the patient is almost into remission.

And then when they're stable, we want to try to decrease medication. Our hypothesis, although we haven't proved that yet, is that maybe that is what the diet change is what is going to help. Like, when you have the disease stable, hopefully lifestyle changes help you to control better the disease, either like needing less Naproxen, maybe at some point, decreasing the medication. And that's what we think about diet as a complementary treatment.

Julie:



Well, it's helpful because it's not this magic bullet that's going to transform every element of your life for the vast majority of people when they're figuring out the right combination of things that they can do to treat their arthritis. But, if you are gonna focus a little bit of your energy on an ITIS diet, thinking about how you can control your inflammation, let's talk a little bit about what is helpful and what is harmful when it comes to particular foods. Are there things that are always on your grocery list, Monica, that you think, "Oh, this is an anti-inflammatory win. I'm gonna go for this one every time?"

Dr. Guma:

Something that Rebecca mentioned before is actually very helpful, regarding diversity and variety. It's not so much about going to the grocery store and, "OK, I'm going to eat salad, and I'm going to eat that kind of lettuce." No, that is not so important. It's more important about, "OK, let's be much more diverse."

Most of the antioxidants and anti-inflammatory ingredients are in these fruits and vegetables. There are so many now in the grocery store that you cannot get bored. You need to use all these ingredients together and be able to increase your diversity. Some of the things that we don't really use a lot, like spices and seeds, that is easy to add in salads or when you cook. They also have a lot of anti-inflammatory and antioxidant properties. That's why people like turmeric, olive oil, chia seeds. They are actually very easy to introduce.

The pro-inflammatory ingredients are more interesting because not everybody responds at the same extent to pro-inflammatory ingredients. There is a lot of debate about gluten and milk. So, in our diet, we decided not to completely remove anything. So, it was more feasible. But gluten, milk and red meat, we try to decrease as much as possible.

But we also know that some patients, they tell you, "I actually noticed that if I eat bread or gluten or pastries, I have a flare the next day. But if I eat hamburgers, I don't have any flare." Well, your body is also telling you that maybe in your particular case, gluten is important, but maybe not other ingredients are going to be pro-inflammatory.

Again, we go back to, if you really want to try a diet, I think it's better to eliminate the more classical things, but it doesn't mean that once you feel that you are doing well, you can add some of these ingredients. Maybe in your particular case it's not harmful.



So, some flexibility is also important. Overall, if you increase the variety and you increase the omega three — as we know, with avocado, fish, seeds, we decrease the pro-inflammatory gluten, milk — overall, patients found that diet was feasible and easy to follow. I think that it's not so difficult to change a little bit the habits. That is what we tried here to change the habits to a more healthy diet.

PROMO:

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Rebecca:

Sometimes we hear about anti-inflammatory foods to eat, especially when you're, talking about microbiome, people will talk about adding miso or yogurt, sauerkraut, fermented foods. Is that also part of this ITIS diet?

Dr. Guma:

We actually did that. We added probiotics, miso, yogurt. As we discussed before, there is no evidence that these probiotics are going to shift the microbiome in the longer run. That's why we have to be very cautious with our results. We were not thinking about we're going to shift the microbiome; it was more about, we're going to give some healthy microbes.

We don't know for how long they will stay there. But if we're giving them the right diet with the right ingredients, we are trying to give them the right microbes as well. But, again, all these things were hypothesis, because you would need really randomized trials for each ingredient. You would need to really, "OK, let's give to a few persons miso and a few persons nothing, and then follow for three months." And that for each ingredient. Now, let's do it with chia seed, curcuma. So, at some point I hope that people have done these big trials to answer these questions.

Julie:



It's good to think about all of the research that's being done to provide evidence for how diet can inform our arthritis experience. But it's also helpful to remember that patients are themselves their own arthritis experiment. And so, it can be helpful to eliminate, and think about, "Well, maybe that hamburger is OK, but that croissant is not. And what can I do to eat the right kind of gluten for me, or the right kind of diet for me?"

Rebecca:

We talked about diversity of our microbiome. But when people ask, "So, how do we restore microbial diversity and correct any imbalances of good versus bad bacteria that we might have in our gut?" Is there anything you can suggest on that?

Dr. Guma:

Basically, when you have a lot of trees that you were discussing before with the forest, sometimes one tree, for whatever reason, can get all the nutrients and then grow much more than the others. And if that one is the bad bacteria, that is bad. But if you are able to give nutrients to the other trees, they will now grow the same. And then the bad bacteria will be at the same level as the rest.

So, even though it's difficult to make that tree bacteria disappear, very difficult, you can probably, with changes in diet, you can probably make all the bacteria like more homogeneous. You don't have that one, much more abundant than the other one. That is a theory, but again, it probably won't work with everybody. For some patients, they will have a fixed microbiome.

Another thing is a strong, or more aggressive, approaches. It's true that for some diseases ... and it goes back to that tree ... clostridium difficile is a good example. You have one bacteria that is very pathogenic. Growth, growth, growth, growth in abundance. And everything else almost disappears. In those patients that deplete all the microbiome with antibiotics, and then you put in a healthy microbiome, hopefully you can restore the microbiome to slow down that crazy bacteria. But we are talking about something that we do because having these pathogenic bacteria is very unhealthy. It's really a disease. If that really would be a good option for our diseases, we still don't know. But some arthritis are really very severe.



5%, 10%, where the disease is very severe. So, if that can be a real treatment for this particular group, maybe. But I wouldn't really say that that is going to be for the general population, because depleting microbiome with antibiotics can have a lot of consequences.

Julie:

So, is it better then to treat your microbiome with food or with supplements, if you're talking about, like, the probiotics and prebiotics?

Dr. Guma:

It will be always better food, because you are adding a different kind of vegetable, spinach or something like that you have never eaten before or not very common. You are probably adding 10 or 12 or 14 different ingredients in abundance that you didn't eat before. You cannot take so much supplements because you cannot really eat 100 different supplements that is all these different ingredients. And a lot of unique ingredients, you are getting from food.

So, it is by far much better changing the diet as much as you can. Maybe a strict diet is very difficult, but a feasible diet that changes some of the habits. Of course, you have to be motivated. That's obvious. But our experience is that it was possible, and it was not difficult.

And then, of course, you always have something that you really want to eat no matter what, you really want to eat. I don't know, some pastry, some croissant. You can do it once in a while, doesn't matter, because you are changing the habits and you are introducing that variety. This is really the key.

So, change the habits, and then you still can eat some of your favorite foods once in a while, but don't do it every day. And with that, you slowly are changing and improving your lifestyle. And hopefully the control of your disease.

Rebecca:

Monica, I know that oftentimes people will spend a lot of money buying supplements like probiotics. I know they are not cheap to buy, and there's different levels, and it's hard to understand. "Do I get the ones that are refrigerated or not?" And that can be



very costly. Since you're saying that it's better to address it through food, would it be money better spent if we spent that money on the supplements on the food?

Dr. Guma:

If I have to choose, I would probably like a choice. "OK, let's get much better food, much better ingredients, let's get much more variety." Because, in the long run, it's going to be a better outcome than probiotics.

I don't mean that in some patients, probiotics won't help. Everybody needs to try what they want. But with reasonable time, reasonable price. Being very honest about what they feel, and then maybe they can try the other option that is actually changing diet. And then they can have their own experience, maybe adding a salad every day, and getting the same results, than taking the probiotics, or maybe getting better results.

Rebecca:

Thank you for that. I think I hear that a lot, in everything you've said, is that if you're gonna try something, give it enough time. But it's hard when you're doing something like this to try all of it at once, because then you don't know which food ingredient is helping you more than the other.

Julie:

And we know it can be difficult when we're saying: Try to spend your \$75 at the grocery store on good vegetables versus on a supplement. But at the Arthritis Foundation, we're committed to helping guide you to those things. So, we're gonna have an amazing e-book coming out, in addition to this episode, that can guide you through some of the anti-inflammatory foods that can improve your microbiome's health. So, if you're not sure where to start, keep an eye out for that e-book. I'm sure it'll be in our show notes after the episode.

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Julie:

Monica, it's very helpful to think about how we can shift those habits, take control of our disease and really start to be considerate of our microbiome with how we nurture our bodies. Thank you. If you are gonna wrap us up today with your top three takeaways that you wanna make sure our patients, our listeners, our caregivers, can take with them, what would those three things be?

Dr. Guma:

I think one thing is that, of course, a healthy diet is going to help in general, not only in arthritis. I think that we need to be much more aware of our health, and that not everything is going to be treated with pills, and that this is not the way to go. You also have to be aware that how you're going to respond to any change that you introduce, it can be very variable between patients, between friends, between colleagues. So, not because something worked in somebody else is going to work in your case. You can try, but you have to be aware of that.

And you need to be sure that you have your disease controlled, especially in arthritis, where if you don't follow up with the doctor, you can get progression of a disease. You can come one day without bone damage, and the following day the X-ray is showing bone damage. So, it's very important that people be aware that they need to control the arthritis, and then they discuss with their doctor about complementary treatments, like a diet.

Julie:

Thank you.

Rebecca:

Good message. Thank you so much.

Dr. Guma:

Yeah. Thanks so much for the invitation again.



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