Introduction and Dr. Tager's Background

Welcome to this episode of the PCOS SOS Summit. I'm your host, Dr. Felice Gersh. With me for this episode is a an incredible man, Dr. Mark Tager. When I think of him, I think of innovations in medicine.

He was there at the introduction of the fractal laser. He was the co-founder of the Vagus Nerve Society. I think everything that's brand new on the horizon.

He is there along with it. So we're going to talk about, well, a lot of what's in his newest book, talking about the relationship of food, nutrition and skin health, which is of vital importance to every woman with PCOS, because we all know that acne is so prevalent in that group.

So welcome, Mark. Thank you so much for joining me. But before we get into a deep dove on all of the great information that you have written about and, you know, we'll talk about just tell us a little bit about yourself and your journey and your involvement in innovations in medicine.

Know it's a long story and it goes way back sort of being one of the OGs in wellness. I did. I went to Duke Medical School where actually I helped start the first nutrition class for medical students, the first elective course on nutrition for medical students.

And I went into family practice, and I was in Oregon, and I set up the Institute of Preventive Medicine in Portland, Oregon, in the seventies. And I would see patients for an hour at a time and teach classes.

We had I got to teach Monday night yoga class and then went on to Kaiser Permanente, where I did directly health promotion for the northwest region. But I've always had this this incredible interest in wellness.

And then it sort of got married to esthetics and about 20 years ago created the FRAX laser with some colleagues. So I've always looked at ways that we have to support and engage patients, consumers in taking better care of themselves.

And so today it's great because we have so many tools that we can provide to folks. And and that's the exciting part of things. So I've always had this love for nutrition and wellness, the workings of the autonomic nervous system.

And I like to say that I'm a recovering family doctor who's sort of seen the light and. But fortunately, there are so many clinicians these days that are doing integrative, functional, anti-aging, holistic kind of work.

So I don't feel so alone anymore as I felt that way about way back in the seventies. Well, I'm in your camp, as you know.

How Acne Relates to PCOS and Hormones

I mean, I just yeah, I was so excited to learn about all the different areas that you've been involved with and this new area where you've talked about and written about nutrition and the role of food and hormones and skin.

So maybe you could just walk us through from the beginning, like, well, first of all, acne, which is devastating to women with PCOS, is recalcitrant cystic acne often.

But what exactly is acne and what's its relationship to hormones? And then we'll talk about how to try to improve it. Absolutely. So let's look at this entire category.

I mean, 90% of the women with PCOS will have one or more skin conditions. And there's certainly acne very

prevalent. But rosacea hair loss, hair thinning, excessive hair grows, face.

They may get a condition called acanthus migrans, which are dark patches on the skin, and that's associated with high insulin levels, rashes, eczema, dry skins.

So what we see is this incredible melding of forces to cause acne. We will see the hormonal changes. We will see insulin resistance and elevated glucose levels.

We will see these hormonal changes that drive sebum production that that drive these changes in the skin. So acne becomes a large concern. Now, what's really interesting is that we're beginning to learn more about the genetics of acne.

There's a test actually back company called Fagron, F A G R O N and they make an acne genetic test to see which women will be more prone to develop scarring or pigment, and also which medications will work the best based upon people's pharmacogenetics.

You know, we each have our genes, and these genes help determine what works for us and what doesn't work for us. So, for example, one person minoxidil, a minoxidil minocycline might work well for someone else.

It would. So we're beginning to see an acne, certainly a greater sophistication in treatment. But so much of this, the skin changes. The skin improvement that we want actually mirrors everything we're doing in the whole body as well.

So all of your recommendations that you make to your patients about weight and diet lifestyle supplements actually transfer over to the skin? Well, the skin is certainly a huge organ.

It's a complex organ. And maybe you could walk us through like a little bit more about the skin. Like, you know, in terms of there's oil, there's, you know, Sebum, there is.

Now we know there's a whole microbiome of the skin. And, you know, it's like a, you know, different layers. There's, you know, the different moisturizers, you know, there's college.

And so maybe you could tell us a little bit about what exactly is skin, what keeps it healthy and then what's going wrong with it. You know, from all of these factors coming together like the perfect storm in women with PCOS to create all these skin problems for sure.

Well, if let's start begin with the anatomy.

Skin Structure, Barrier Function, and the Gut-Skin Axis

You've got essentially three layers the epidermis, the dermis, and then the hypo dermis. So the epidermis actually, if you think about it and this this is sort of really interesting.

If you could pull out one hair from your head, I can't do it. But the width of your epidermis, that's the width of your epidermis. A cross-section of the width of a hair.

So that is the epidermis is that is essentially critical for keeping moisture in the skin. It is the first line of barrier protection. It is the beginning of immunity as we have these cells that participate in in immune health.

But the dermis is actually where the real action is. And there's two layers of the dermis. And we see that's where the blood vessels are. That's where the nerves are.

That's where the immune cells are. That's where the stem cells are. In fact, we have something called the DE junction, which is the junction between the epidermis and the dermis.

And this is undulating, undulating layer, and that's where stem cells reside. STEM cells also reside in the hair follicles. So we've got this incredible system of protection and barrier protection in the epidermis and the action where we've got the nerve fibers, the blood vessels.

And it's interesting because the skin really likes to keep things out. I mean, that's its job. It's it's it a lot of the things moisturization, certainly, but the skin is a pretty tight barrier.

And if we think about it, between five and about 8% of the blood flow goes to the skin. And this is where we're bringing the nutrients, the essential nutrients into the skin from the blood vessels, as opposed necessarily to trying to shove these nutrients into the skin.

In topicals, obviously, it's both. And, you know, I've my book is called Feed Your Skin Right. And I answer four questions. What should I eat or supplements should I take, what procedures should I have and what topicals should I apply?

And the recommendations we make for skin health and beauty are even more important. Because you're right, the perfect storm we've got hormones, we've got the sad diet, which is really I mean, if you look at acne, the studies show that, wait, I mean, go back and tell a funny story.

You and I had dinner one night a couple of months ago, and we reflected back upon our medical training in which we were dinosaurs. Then when you were to ask a dermatologist, Hey, does diet have anything to do with acne?

They say, Oh, no, it has nothing to do with acne. And now there are still some dermatologists who say that, but we know that dairy, we know that sugar, and we know that fatty foods all contribute to acne.

Throw in hormones, throw in a little zinc deficiency and other mineral deficiency. And that is, in fact, what you mentioned is the perfect storm. Well, in looking at the skin or many different areas of the skin impacted, then when you have PCOS, like you mentioned, you know, all these different layers.

So is it like it is really like a or a layer wide issue, like the barrier function is being impaired, the moisturizing capabilities, the blood flow to the to the skin.

All of these things are part and parcel of the development of acne in women with PCOS. Yeah, what we really have is we have the coming together of a number of factors.

We have inflammation, which is systemic inflammation. We have the changes that take place in the gut and the gut microbiome as a result of these hormonal changes, as a result of that dietary changes as well, the diet.

So what we're learning now is that there is a gut brain skin axis and you know, that's the triangle. So what you eat and your hormonal state affects the bacteria in your gut. Now, I often ask people to to tell me how much they think their brain weighs and it sort of stubs people and they go anyplace from half a pound to £10 and it's about 3 to £4.

Well, the bacteria in your gut weigh about the same amount. So we have to think of our gut bacteria as an organ. Now, what they do is they produce neurotransmitters and they produce short chain fatty acids.

Now, the short chain let's take the short chain fatty acids first. What they do is they produce beta eight and beta. It's essential for the lining of the gut, but they also produce propionate and acetate.

And acetate actually goes and throughout the body and we will see that in the skin. So people with acne often have very, very low levels of acetate, which is a short chain fatty acids, which is critical.

So what we do when we start trying to change the microbiome with fiber, primarily with fiber, with some probiotics, with dietary changes, we are trying to feed the bacteria and particularly one kind of bacteria.

It's known as Akkermansia. It's one of the commensal good bacteria and akkermansia is what is actually producing

the acetate. So we there are some companies that have, for example, probiotics that stimulate akkermansia to produce more lactate, and that lactate actually is helpful for the skin.

The other thing is that these these bacteria enter interface with the nervous system. And this is where a lot of the anti-oxidants work. They tickle, they produce substances that tickle the vagus nerve, the afferent fibers of the vagus nerve that go to the brain, that send signals down to decrease inflammation in in the spleen and the macrophages.

So these there are these wonderful connections and these cycles that they come together. So this is why we say that so many of the conditions begin in the gut.

And if you look at and there have been studies on this, if you look at the the diet of women with PCOS, you just analyze those diets. They do not consume a good diet.

They're deficient in fiber.

Diet Strategies for PCOS and Acne

They're deficient omega threes, calcium, magnesium, zinc, vitamins, particular. And there's niacin, for example, is deficient. So we see this constellation that mirrors the standard American diet, but it's often worse because we see and the effects are worse because they're magnified because of the hormonal and the insulin resistance kinds of activities going on.

Well, so it certainly would seem like the limited approach that many doctors and patients alike are taking, which is just putting on topicals, is really missing the boat.

That what's going on in the gut really needs to be addressed. I mean that otherwise you're just fooling yourself, that you're really solving the problem.

Would that be a good way of thinking about it? You know, we both subscribe to an overarching philosophy of root cause, cause medicine. And, you know, this is, in fact, what distinguishes the kinds of care that functional integrative practitioners practice.

So what we've done is we have siloed health care into various efficient little silos of 12 or 15 minutes. And you get one problem, you get one chief complaint.

So if if it's GI origi doctor and again, you go to an endocrinologist, if it's cardiology, you go to a cardiologist. And really what we need to do is look across these multiple symptoms and we will always come back to lifestyle, exercise, diet, stress management.

Now, what's the problem with that? The problem is you look at the traditional allopathic system, which is great for acute care and it's great for surgical interventions.

It's not really set up to spend the time and energy on a root cause. Medicine. So this is where the analysis of exercise and diet. Now just let's take PCOS.

What just what one of the things we know is that intensity of exercise and resistance training are more important, actually, than duration. So we we want to be able to have PCOS and patients doing more intensity in their workouts.

It's does not it doesn't mean it has to be as long. And then also getting that resistance training now. And the other thing is that the not only do we have to first begin with diet, because you and I both know that you can't supplement a crappy diet.

I mean, you can make all the supplement recommendations in the world. But if someone is going home and eating

all of this refined sugar, £125 a year, if they are eating this high fat, high carbs, nothing.

I mean, we can recommend supplements, but they pale in comparison to the importance of making the dietary changes. Now I really subscribe to something that Geoff Bland said not terribly long ago, and that is that we have to think of supplements as conditionally essential nutrients, conditionally essential nutrients.

So in this case, that condition is PCOS and there are some essential nutrients that can be really, really helpful. So I think that, you know, you want to be able to ramp up and peak, you know, so, so much of disease is tied to mitochondria.

Mitochondria, the little energy factories matter organelles that produce the energy in the body and amp k is an enzyme that turns this up, turns up the burning of energy.

It's sort of like a little thing. So we can turn up a lamp. Okay. A number of ways. One of the best ways is with Berberine. There's been a big movement for Berberine.

It is one of those energy sinks. It goes ahead and turns up Ampk. It does this fairly naturally. It's fairly safe. You don't want to take it. Obviously, when you're pregnant or breastfeeding.

It's also contraindicated if you're taking metformin as well because you get additional GI symptoms, but it has really good effects on the glucose issues faced by women with PCOS and also can help and bringing down cholesterol.

One of the problems is it's not very well absorbed and there's one there's one of the brands and Zomedica has a version that is coated with fighter arms.

So it's an and it's a berberine fight us zone and that enables better absorption because left to its own devices, berberine is not well absorbed. So I think that's an important thing.

Vitamin D is critical. It increases insulin synthesis and its release is also important for the barrier protection of the skin along with omega threes.

You know, if we think that, you know, we've all heard about leaky gut, but there's leaky skin as well. So the gut lining and the skin are pretty similar in terms of what they do.

But we want to keep this skin barrier intact and vitamin D plays a role in that. And particularly the omegas are very important. So fish oils, flaxseed oil is is excellent for this as well.

And then, you know, there's all of the antioxidant support we want to do with green tea. And I like xanthan, but there's there's all of the vitamin C is important.

So all of these things combined, but they're conditionally essential nutrients based upon getting people to first change their diets. And they've got to move towards a mediterranean diet.

Keto diet has also been shown to be effective for women with PCOS. So in terms of let's go backwards, I mean, by the way, I'm also a big fan of Berberine and let's go backwards to start like you talked about with your book, with the diet, you know, you said the three things.

So let's start with diet now a lot of people know you shouldn't eat a lot of processed foods, but maybe just give an overview of what are some of the key foods that every woman with PCOS should really try to include in her diet on a daily basis or a weekly basis.

So maybe just walk through the diet first a little bit more. Yeah, yeah. So where you want to go is first of all, you want to rely heavily on plants. And if you think about like I go out to my garden and I see all these colorful plants and I know when I'm eating the rainbow, I'm getting all of the phyto nutrients that are important for my health.

And I'm also getting fiber and fiber, if you think about fiber, is the food for the good bacteria in the gut, that's where fiber does. You feed the gut bacteria, fiber, they make those short chain fatty acids, they make the neurotransmitters.

But, you know, it's it's hard because, you know, so many of their recommendations are eat less of this, avoid this. And, in fact, we've got to get away from fried foods, chips, French fries, corn chips, saturated fats, butters and margarines, cutting back on red meat, keeping away from processed snacks.

If it is manmade, either it is a manmade snack that that's what you want to keep away from, you know, decreasing your packet and get in the habit of reading labels.

Look for added sugars. I mean, there are some things that, quote unquote, you know, are protein bars and you see massive amounts of added sugars keep away from the prepared cereal, high in sugar, in snow meals and sugary beverages.

Moderate, be moderate in the alcohol use. Cut down on refined flour, white bread rolls, pizza, crust pasta. You know, the problem is when you when you go down that list, you know, you feel like, oh, my goodness, how many times have I preach this?

So what really has to happen is a fundamental shift in mindset. And this is really hard to get people to do in which people make that shift and say, I'm going to adopt a wellness lifestyle.

I'm going to move my body, I'm going to manage my stress, and I'm going to nourish my body in a way that that gives me the energy I need to live my life, keeps me at an ideal weight, helps me manage and deal with this PCOS and and that means you turn more plants.

You eat less, you are more thankful, you eat slowly. I think those are the keys. There has to be at some point a fundamental shift up here in order to make the dietary changes.

So many people actually do know what to do these these days. I mean, they know what when they're eating well, they know when they're not eating well. The other thing is that, you know, it's the 90% rule.

90% of the time you eat really well, you and 10%, you know, somebody's birthday and you're going to have a small piece of that cake. And that's the 10%, but it's the 90% that we've really got to work on.

And, you know, it's you sit with people and you say, what's the key? What's the what's the key that I can use to unlock this problem and and get them motivated to make that kind of change.

So that's what we all do and that's what takes the time and energy and and caring for folks. So would you say that you mentioned, like eating the colors of the rainbow, just a diversity of different plant foods, fruits, vegetables?

Or are there actually, you know, how foods become certain fad foods like are there actually superfoods or don't need to worry about that. I'm not a fan of this.

Five foods to eat for PCOS, seven foods to eat for hypertension. And the reality is we've got to just be more plant based. We've got to stay away from the stuff that was made and made in a laboratory, in a factory.

Got to minimize the additives and preservatives in food.

Dairy, Gluten, and Individual Food Sensitivities

So I, I think that's all gimmicky. And I get asked that a lot. You know, some journalists like to tell you what's the five foods I should always eat. Now, having said that, there are some foods that you can lean on.

You lean on things, you lean on your avocados and your walnuts and flax seed. You lean on those things. You try

to get them into your diet. You lean on the sour, the fermented foods, the sauerkraut and kimchi.

You lean on that. You lean on those fresh fruits. You lean heavily on those. You lean on seafood. And perhaps lean chicken, for example, is something that you can many people can lean on.

You can lean on eggs. Now, I have to go to one of my personal rants, if you will let me. And then it's to do with the myth that we were told for so long about Fats.

You know, fats are bad. Fats are bad, really. And so generations, our generation and others. Yeah, maybe 20 years. We threw out the egg. Yellow's thinking, oh my goodness, there's 300 milligrams.

It's cholesterol. Oh, how bad that is? Well, actually, your liver makes many, many, many, many more times that every day. And it makes it from saturated fat.

But when you throwing out the egg yellows, what is throwing out all the b vitamins, A choline, which is essential for brain function. I mean, over more than 90% of people are not meeting the estimated average requirement for choline.

So that's that's one of my personal rants. So the eggs vilified egg yellow have been vilified periodically we either elevate up or vilify foods. And yet it's really a balance that's most important.

And trying to eat the food that looks like it kind of came from the ground or, you know, came from a pasture. And I think that those are the important things.

And then, of course, that you're going to you're going to layer on top personal beliefs. Are you vegetarian? Are you a vegan? Are you pescatarian? So you can layer those beliefs and what seems to be working for you on top of all that is. Well.

Now I have to just ask you a little bit more about dairy, and then there's a question of fermented dairy, like yogurt is full fat or nonfat or, you know, or what's bad about dairy and acne.

Maybe you could just tell us a little bit more about the whole issue of dairy in women with PCOS and acne. Yeah. So again, there was a large study that was done compiling all the research on diet and they did find that dairy was a major contributor to to acne.

Now if you look at the spectrum of dairy, you've got first of all, you've got lactose and lactose intolerance, which, by the way, is genetic. I happen to have the genes for lactose intolerance.

So I'm very careful there. And then you've got full fat versus the skim approaches of dairy as well. So what people are you know, people can have allergies, by the way, to the proteins.

They can have sensitivities to the sugars that are in in dairy. So what you have there is you've got this spectrum of relationships. Now, there is some data that says that when we took out the fat in milk, they replaced it with more whey and and that actually can cause more GI upset than full fat milk fermented milk certainly easier got the bacteria.

It it is it is a natural source of of of bacteria and I think that's so I recommend and again this is all individual some people do really well on on dairy others don't.

You can go ahead and get your an I g panel on people, by the way, which is also very helpful. Or you can do dietary eliminations with folks and I recommend that people take take dairy out of their diet along with the other foods that cause allergies that are very prominent, go cold turkey for 4 to 6 weeks and then reintroduce dairy and see what happens.

So we have a genetic overlay on this so we can't make this blanket statement that everyone needs to avoid dairy.

In some people there is provokes acne.

In others it doesn't. So I think you want to find out where you stand on on acne each one of us because of your genes, because of any sensitivities you've had, because of the IgG component, the immunoglobulins.

So all of those combined so that we make this general recommendation. But I think what we really want to do is have more specific recommendations. So IG food testing and elimination diets to help people find out more about their relationship to dairy.

Another big area that people talk about is gluten. So is there any relationship of gluten and acne? Is that an actual issue when it comes to the acne aspect of PCOS?

Here are we have Frank celiac disease that affects 1% of the population and then we have other folks who are sensitive to gluten who have non-celiac gluten sensitivity, and that could be anyplace to six, 8% of people.

So again, we have this relationship to a food. Now there's a relationship when we have the genes that are around the HLA genes for celiac. This is a very significant problem for people.

But what about the five, six times more people who have some form of gluten sensitivity now that will again, we've got gut, brain, skin and we've totally left out the brain in this.

We've just talked skin and gut, but we've got this triangle. So what we will see are people with gluten sensitivity and some who will manifest with skin issues. Why?

Because what it's happening is in the gut it is being manifest in the skin. So again, what is your relationship with gluten? I mean, if you think about it, it's a is very complicated human beings have 20,000 genes, wheat has 70,000.

So we is a much more complex organism. And, you know, many people, when they get wheat from Europe and Italy, they don't have GI symptoms. But if you are having GI symptoms, very often this will manifest one way or another on the skin and it manifests through the production of the short chain fatty acids.

It manifests through the neurotransmitters that are sending signals to the brain and to the skin.

Key Supplements for Skin and PCOS Support

So if you want to begin to get great skin, you really need to address the gut. And that's why so many functional practitioners begin their work with the gut.

And it's the gut work is fairly standard. You cannot remove the the harmful agents for the gut very often where you will see people with lead leaky gut.

And what we'll do is we will see. So in 1975, we thought that everything in the gut was glued together, the one cell lining was glued together. And then Japanese researchers found, you know what things could pass between these cells into the gut.

And this is where the whole theory of leaky gut began. We have Xinyu Lin, which is a protein which opens up those gates discovered by Alessio Fasano. And now we're letting all of these proteins is under digested fragments into the body.

And what happens is they get a mimetic effect. So a, you know, we have these receptors and a little protein comes along and it kind of looks like the protein that should be binding and it binds in fact, and causes inflammation.

So we'll see this in the joints and we'll see this in skin. And this is where the connection to leaky gut and the connection to the gut microbiome plays a big role in eczema, in psoriasis.

And it's also connected to the brain as well. So we really do need for PCOS patients to return to a serious deep dove of the gut and make sure we can fix that and get that working well and attend to the lifestyle and attend to the diet.

So it's not just one thing. It's not just, you know, take your metformin. It is a a holistic approach to treatment. Well, I 100% agree. And we know that even when you eat a really great diet, sometimes vital nutrients can be insufficient.

And you already touched on some of the great supplements that can help women with PCOS deal with their acne and and other aspects of PCOS. So maybe you could tell us a few more.

You mentioned Berberine and B, the Omega Threes and vitamin D, are there others? I mean, it's very difficult for anyone to take like 70 pills a day, you know.

So I guess we have to like prioritize or take them in groups together or how do you tackle this, you know, supplement issue and what of the key ones you would recall?

So I handle this in the Feed Your Skin Right book. And and the answer in many ways is it depends. It depends on your your individual, your genes, the medications you're taking.

I think that's critically important. It depends on hormonal status. It depends on the quality of diet. It depends on diseases that people have. So there is no one answer.

Now, having said that, everybody wants, okay, stop, stop it. Tell me what I should take. So I'll tell you, give you some some some ways to approach it.

I think that given the fact that more than 90% of people have vitamin D deficiency in this country, don't even meet the estimated average requirements of vitamin D3 K to supplement is important and, you know, that's one the fatty fat soluble.

So you take that with it with the meal. So vitamin D. Now the other thing is to make sure to get a good high quality fish oil, and that's important to get your omega threes up.

So I think those I think of those as skin barrier protection. Okay. Now, 72% of people in the country say they're taking a multiple a daily multiple vitamin mineral.

I'm not I'm not impressed very often, but the quality of some of those supplements and if you look at some of the most common popular ones, they've got all sorts of food dyes in them.

They've got all sorts of magnesium stuff to bulk things up. They've got things that shouldn't be there. So I do think that a quality multiple vitamin A mineral is fine is a good thing.

Now let's talk about K. So that's your skin. You need antioxidant protection. Okay? Antioxidant protection means additional vitamin C if you need it. But I actually am a big fan of Astor's anthem, which is the which is a carotenoid that gives the salmon their their red color.

And it is a great antioxidant. So I recommend that again, it's I take that with a meal. CoQ10 extremely is another excellent one. And then once you start thinking about that, you're thinking about your mitochondrial health because remember PCOS, one of the issues is it's a mitochondrial issue.

CoQ10 particularly important because got 26 million Americans that take a statin. Statins notoriously deplete CoQ10 and that's in fact maybe why we get these muscle aches and these muscle problems because we are depleting coast Q10 So CoQ10 is is very important as well.

So that gets us the mitochondria along with the most part magnesium. Now magnesium is another key ingredient that comes in very many forms and in general the glycine form is good, but I like to lean on the tawny and this little

taurine that that crosses the blood brain and the three inning and then cross the blood brain barrier.

Those are forms of magnesium that also cross they go to the brain better. And that's that's a good thing. That's a it's a nice little addition. So Glycine eight three 3D Tawny those are those are really good magnesium.

So I magnesium is important. Getting enough calcium is good. The other thing is blood vessel, health. And we know so much more now about I mean, you've got 60,000 miles of blood vessels going throughout your body and inflammation really is begins it at the linings of the organs and these cells that line the organs actually secrete specific NGO lines, which are little different cytokines in each organs.

So it's very specific. So you want to try to keep the health of the linings, just like the gut. You got to protect the 60,000 miles. So I'm a big fan of things that protect the glycocalyx I like okay.

glycocalyx is a little hairy lining that lines of vessels I like a product called a Churchill it's remnants the seaweed that that is very protective. I also am a big fan of nitric oxide.

Nitric oxide in addition to the to the mitochondrial activity. It does help with blood vessels. And as you know, in fact, you've taught me, if you look at these pathways, the pathway whereby we take arginine and we make nitric oxide, and we also get it from nitrates that are converted over.

So when you manufacture a nitric oxide in the body, you're taking the amino acid, arginine and oxygen and an enzyme called A. S. Nitric oxide synthase, and you make nitric oxide.

But what happens is, first of all, some people have defects in the NOS3 gene, but also that genetic enzymatic activity is dependent upon your favorite hormone that on the dial.

So in fact, you actually taught me this. So we're looking at at estradiol and as we get decreases estradiol and we get and then genetically some people have are just have variance in their NOS3 gene so these folks are not making the nitric oxide that they need to so we fix the hormones, but we also have to supplement nitric oxide. And most of that is going to be a supplement that's coming from beets and arugula.

There are there are some nice little Berkeley life makes a product. Human end makes a product. I like the little chewable tabs and you know what's fun about that is they have these little salivary tests that you can actually test your nitric oxide before and afterwards.

And the oral bacteria is really critical in converting the nitrates in to a nitric oxide. So so one of the reasons that people some research says we really shouldn't be using mouthwash because what mouthwash is doing is killing off all those good oral bacteria that we need to convert the nitrates eventually into nitric oxide.

Where to Learn More and Closing Remarks

Well, so glad you brought the nitrates and you know, a little plug there for beets and other green leaf peas, right? I love the veggies. Nitrates almost every single day.

So this was incredibly fascinating. The whole new area of linking the gut, the brain to the skin, which, like you said, it wasn't that long ago. It's in my memory banks when dermatologist would literally say, quote, It doesn't.

Matter whether it matters. Or has nothing, nothing to do with your skin, nothing to do with acne. And now, of course, we know it has everything to do with acne.

And and this is like transformational for women with PCOS. This is in like a little bit of information out there, guys. This is truly transformational information.

And I know everyone out there because the majority are dealing with these skin issues. I would love to learn more about what you're doing. You know, your your books. I know you have many books.

And of course, this is the latest one. But learn more about and from you. So how can they how can they do that? Well, first thing I may want to grab Feed Your Skin Right. It's on Amazon.

They can follow me at DRMTager on Instagram. D R M TAGER They can hit me up on LinkedIn professionals. I really encourage to have a bit of a LinkedIn dialog because that's just a great place to sit where we can exchange information.

They could hit me up at contact@drtager.com and they can follow you. Follow me at some of the conferences we speak at. We have an online training course, by the way, for professionals called Inside Skin Beauty and I hope I like you I'm pretty approachable. So questions.

I've been more than glad to handle some of those. If you get in touch with me in any of those ways. I can't thank you enough and I can't wait to see you at some upcoming conferences.

I'm sure we're going to cross paths as we always do. So thank you again so much for joining and for sharing all this vital information. Thank you.