Metabolic Reprogramming: The Gut Microbiome and Peptide Optimization Transcript

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Introduction to Kiran Krishnan

Everybody welcome back to the Bioregulator and Peptides Summit. We have a rock star guest with us today. This next guest is someone who needs very little introduction in the integrative health world.

But I'm going to give him one anyway because his background is rock star status. Really. Kiran Krishnan is a research microbiologist with over two decades of experience spending, molecular medicine, clinical nutrition and microbiome science.

He trained at the University of Iowa, where he did hands on R&D in molecular medicine and microbiology before leaving academia to bridge what he saw as a critical gap the distance between cutting edge research and real world clinical application.

And boy, are we ever glad that he did, because he has really? Well, you've really changed the landscape of gut health and what we can do about it. So most of you likely know Karen as the co-founder and chief former chief scientific officer of Microbiome Labs, the company behind Mega Spore Biotic and arguably the most research driven probiotic company in the integrative medicine space.

What really set Microbiome Labs apart from day one was an almost radical commitment to clinical validation, with Karen personally designing and conducting dozens of human clinical trials in human nutrition.

He's published research in peer reviewed journals, holds international patents in his name, and currently serves on the scientific advisory boards of multiple companies in the health and wellness space.

Also, he is currently General Manager of Novo Sims one Health North America. We're closing now, folks. We're almost there. But what makes Karen so perfectly suited for this summit is the way his deep expertise in the microbiome, the immune system and the gut body axis intersects with the emerging science of fire regulators and peptides.

Because, folks, this is not just about talking about the small molecules. It's about talking about the terrain that they're landing in and its impact.

So the gut, after all, is worth so much of the regulation of the human system begins. And Karen sees that connection more clearly than pretty much anyone.

Karen, welcome. Thank you so much for being here. I am so happy you said yes to this. It's my pleasure. I would never say no to you. Net so. Well, you know I'm in.

I'm in. Yes, well, I'm all in. So basically this is what we're talking about. You know, their, their interviews in this summit that are about molecule this or peptide that.

But for me, I've always so firmly believed that it's we need to set ourselves up for these molecules to do in our bodies what we want, what we need them to do.

Right. And and to that end, many of them are endogenous to body. Why aren't they doing what they're supposed to doing in the first place? So we decided, you know, in our if we were going to name this, we were going to talk about the catabolic and anabolic battle of aging.

And in that sense, on the catabolic side, we're going to talk about those metabolic peptides that as being inhibitory.

And we were going to talk about the repair peptides as stimulatory.

Why Gut Health Matters for Peptides

So I'm going to let you decide where we begin. And let's rock and roll. Yeah. You know I think there's a lot of meat in both sides. But let's let's start with the metabolic peptides.

I think that is getting a lot of attention. That's probably a lot of people listening to this who are on the fence or maybe trying to decide whether they want to go down the roots of the LPs, GI peace and so on.

So let's let's start there and talk about the role of the terrain in optimizing the effect of the peptides, and then also creating a scenario that allows them to successfully come off the peptide.

Right. Because that's where we're seeing things start to fall apart. Somewhere around 70% of the people that started quit within the first year. And that for myriad of reasons, it's economics.

Sometimes it's it's the side effects of too much. And, you know, they discontinue the peptides, but then the people that do stay on it and have success with weight loss, majority of them regain the weight and more when they come off.

Right. So let's talk about how we mitigate most of those things. Yeah. Yeah. And I think that's really important. You know, I mean there's a number of us talking about well, you got to work out.

You got to change your diet. You've got to do all the things. Yes. You got to be sleeping all the things. And I think that to put that burden on people without addressing the underlying terrain and its impact, you could be doing all those things and still not get the outcome on the other side of using these compounds that as you want and as you said, this might even help them to work better at a lower dose.

So yeah, I think this is what are you using a GLP now or not or GIP or triple agonist when when it becomes available. This is a really this conversation is really going to be important to your current and future self.

Yeah. So let's talk about why you may need one to begin with. Right. So why are you struggling metabolically that you need to go to this level in order to lose weight and kind of regain your metabolic health?

And they can be the guys can be very powerful, a really strong tool, but they shouldn't be a crutch. They shouldn't be a replacement for key foundations within your system.

They should be a tool to accelerate change. But the change should also come foundationally. So let's talk about what is happening in people who are metabolically struggling.

So people who are insulin resistant, people who have excessive amounts of body fat, who have excessive amounts of visceral fat, the gut microbiome is absolutely involved in that.

And so is something called chronic low grade inflammation. Right. So there is a phenotype or a fingerprint, if you will, of what an metabolically unhealthy gut microbiome looks like.

Right. So typically what those individuals guts look like is number one they're leaky right. So they have leaky gut.

Leptin Resistance and Metabolic Dysfunction

They've got a lot of chronic low grade inflammation throughout the body. As a result of that gut being leaky. They are leaking through their gut into their liver and the circulation endotoxins.

These are toxins that are produced by microbes within the gut. That's why they call endotoxins, as opposed to exo toxins that come in from outside. And these endotoxins have a dramatic ability to alter your body's metabolic

response.

And I'll explain what they do. So so remember, they typically have a leaky gut. They have low diversity within their microbiome. They also don't make a lot of short chain fatty acids for a couple of reasons, which is they don't eat enough fiber.

And then they also don't have enough diversity to convert that fiber into the short chain fatty acids. Now, your short chain fatty acids are part of your natural GLP one like system.

So you're not utilizing your natural GLP one like system. And there's very poor communication between your gut and your brain because you've gotten your brain intimately connected through the vagus nerve.

And and the thing is, about 80% of that information on that bidirectional highway of the vagus nerve goes actually from your gut to your brain. So your gut is signaling to your brain a lot of different things, including the nature of what's happening in there during digestion, during eating, when you should stop eating when you're full, and so on.

Right. So let me let me just reference a couple of studies we did a few years ago that illustrates this point very beautifully. Most people tend to start gaining weight because they overeat.

It's just that simple. Right, right. And all the fancy studies and all the, you know, bio hacks we think of, it comes down to a law of thermodynamics issue, where it's like the number of calories you take in versus the number of calories you burn.

And over and over again, studies have shown that that's really the key to weight loss. It's not that's different for insulin resistance and all that. But when it comes to weight gain, it's the number of calories you take in versus how many you burn.

And if you're taking in more calories than your burn, you're going to store those those access calories as fat. And so people who have gained weight and continue to gain weight and struggle to lose it have an issue of taking in so many to many calories.

Right? Question I have a question. I don't want to interrupt you, but I do want to ask this question because this is a raging debate, right? Because we also see people who don't eat enough calories, who are gaining weight.

So I just want I just want to invite you to qualify that so that people don't sit there, roll their eyes and go, not true. It's not calories in, calories out.

I think I know that you you're going to feed that. You're going to address that nuance. But I just want to make sure that we tell people we're addressing that because, yeah, it's I think when things go sideways that math starts to change a bit.

Well, so you also have to look at what we call energy harvesting, you know, so so when we look at calories. So this is a simplified view of it. Right.

So when we look at calories we look at a food and we look at the back of the packaging and we go okay this says 250 calories. Well how do they determine that 250 calories?

It's the thermogenic effect of the food, right? So there's a standardized laboratory test where you burn the food and you look at how much energy comes out of it.

So then you're estimating the energy value of that food, right? Right. Now that 250 calories, maybe 400 in you and 150 in somebody else. All right. Right.

There's a difference in how much of that you can harvest into your system. And that's where the math gets a little bit thrown off depending on people's, you know, people's physiology and what's going on with them.

Right. Great. But but ultimately the reason why GLP ones work is it costs you, cause you to stop to eat less. For sure. For sure your desire for food goes down, your you feel more satiated, more full, and people aren't necessarily changing their diet.

They're not taking this drug and the drug is making them eat, you know, vegetables and fresh fruits and all that stuff. You know, we wish, right? It's not doing that.

It's just making them eat the same things they were eating before, but less. Yeah. And as a result, they lose weight. So if you reduce the caloric intake, you're going to lose weight.

Now, why is it that we we have this tendency to have excessive calories in consumption? One of the biggest reasons is something that was discovered a few decades ago called leptin resistance.

Right. Leptin resistance when it was discovered about 25 years ago, was going to be the kind of be all end all for obesity, right? They figured, oh, we now know why people are overeating, why they're taking into many calories more so than they can burn.

And and we can now figure out a way to modulate that system. And in order to get people to stop eating now, they went after many different mechanisms and trying to figure out leptin.

But the part that they didn't connect was the role of the gut in the function of leptin. So they never were successful in developing compounds that affected leptin.

So what is leptin. Right. So leptin is your satiety hormone. When you eat food there are all these signals that come from the gut. Once you've taken in adequate amount of food in terms of volume that starts kicking up, you're telling your brain to kick up leptin.

Right now, that's important in two different ways. Not only does it make you stop eating because you feel full and you feel satiated, it also turns on the metabolic processes in your body by amping up things like Ampk, and which are things that help you release more insulin, burn more fat.

Start telling all the cells in your body that, hey, food has come in. Start metabolizing. Start burning fat for fuel. It's signaling all of those things.

So it's a master regulator of your metabolism. The problem with it is that if your gut in your brain aren't talking adequately, the gut is not getting sick.

Sorry, the brain is not getting signals from the gut that there's adequate amount of food volume that has come in. So stop producing the hunger hormone and instead produce the satiety hormone lectin.

Right. That is the lectin resistance model is that we're not responding to lectin or we're not getting the lectin release response. Right. So we studied this in people with leaky gut.

These are lean individuals average age of 22. Right. So they were metabolically perfectly healthy. But we knew they had severe leaky gut because we screened them for severe leaky gut.

So their guts were messed up. But they weren't obese yet. Right? Right. They were luckily young. So they were they were like very active. They were college students or playing sports or doing all of these things.

So they were they were active. They're active. Byrne was really high. They had good lean muscle mass. So their basal metabolic rates were high. So they weren't putting on weight yet.

But we wanted to see that even in those individuals, were they left in resistant. Right. So what we did is we would we would bring them into the lab, they would come in fasted.

So they had been eaten for almost 12 hours. So they'd ghrelin their hunger hormone levels are really high. So we'd measure that a baseline makes total sense, right.

Hunger hormones. The body is trying to tell them, hey, you got to go eat. You haven't eaten in a while. Great. So then we send them down. We gave them almost a 2000 calorie meal.

Right? For a lot of people, that's your daily caloric. Yeah, right. It's huge in one meal. So you should clearly the body should say, okay, once I've eaten that I don't need any more food.

I'm good for now. Let's go be active. Right. So here's what happened in the people with leaky gut. And this is this did not happen with the same age. People who do not have leaky gut.

What happened is they would eat that 2000 calorie meal. And the ghrelin levels, the hunger hormone levels would continue to stay elevated, I think. Right. But nightmare.

Yeah, it would dip for about an hour and then it would start going back up again. Right. So they're not getting the lectin satiety response. And in fact their brain is telling them eat more.

So it's very easy to overeat in that kind of in that kind of setup. Right. So then what we did is we took those same individuals. We gave them probiotic for 30 days that we new alleviated leaky gut.

And then they came back in 30 days later. And we did the same exact test. They come in fasted. Ghrelin levels are high. In fact, the baseline ghrelin levels were a little bit lower than they were in the beginning, but nonetheless it was still elevated.

We gave them the the the food and ghrelin levels drop almost 60, 70% right after eating, and then leptin levels came up 50%. Right. Exactly how you want to see it, a reestablishment of the communication between the gut and the brain.

Because the thing is, the brain does not know what you're eating. It doesn't, you know, you think it does because you're seeing the food and all that.

But that's not how it measures what you're consuming. It measures what you're consuming by what the gut experiences as expansion and the amount of gastric fluid that's being released, the amount of bile that's being produced, like those are the mechanics behind ejection that tell the brain, hey, plenty of food has come through.

Let's kick up satiety hormones. Let's stop the hunger hormones and let's start going with our metabolism. That system is broken in people with leaky gut, dysfunctional guts.

Right. So the underlying mechanism here. And so let me give you another example of that. So then we took that one step further and we said, okay, if it's the gut that's responsible for this, then we should be able to take obese individuals, tell them nothing about what we're studying. Right.

We just saw them. Hey, it's a tolerance study of some natural supplement. We didn't tell them it was a weight study. We didn't tell them any of that. And we basically said, just keep eating.

Whatever you eat, do whatever you do. Don't change anything about your lifestyle. And we had a placebo controlled arm in it, and all we gave them was a probiotic and a tiny amount of prebiotic that increased the short chain fatty acids.

Now, why that's important is because those short chain fatty acids are butyrate. Kick up the metabolic processes right it up, regulates your natural GLP ones, it up regulates, you know, insulin response and so on.

So we wanted to shift those metabolic profiles. So just a probiotic a little bit of a prebiotic. Then the other group got a placebo pill which didn't have those actives in it.

And then in a in a 12 week study we just let them take it once a day. Again, no instructions, nothing to change. They didn't really change a whole lot about their lifestyle.

In that 12 week period, the obese individuals lost 35% of their visceral fat mass, right? Wow. So that's fat around the organs. Around the organs. That's the most unhealthy fat that's hard to lose.

And then they lost, you know, subcutaneous continuous fat as well. And then we did. We looked at the glucose response markers. So we looked at things like C peptide and fasting insulin.

Those improved quite a bit. Then we also did something called an RNA blast, which is where we looked at all of the genes that were being triggered in these individuals.

How Fiber, Polyphenols, and Probiotics Support GLP-1 Use

We looked at over, I think it was a 400,000 genes that we could measure through this, this assay that we had. And we basically saw that all of these metabolic genes that were previously not turned on because those were so silent, because of their leptin resistance and their poor insulin resistance, their insulin resistance and poor sensitivity, all of these genes are firing back up again.

Wow. Right. That signaled an improvement in metabolic health. And again, they were not exercising. They were not dieting. They weren't doing anything different than they were.

All we're doing is changing the gut microbiome. And we call this that. I had written a white paper prior to this called metabolic reprograming. There you can reprogram your metabolism by shifting your gut microbiome.

Right. And so I say all of this to emphasize that the reason you're likely in a place that you need a GLP one agonist or, you know, triple agonist or double agonist, whichever one you're considering is because those underlying systems are dysfunctional, right?

Which means that unless you fix that underlying system, although the agonists are going to push you to eat less and you're going to lose weight when you come off of them, you're going to gain the weight back, right?

Because you're not fixing the foundations with a fancy. So the strategy should be to fix the foundations while you're on the agonist. So that was going to be my question.

So then doing this work, the prebiotic and the probiotic while you're on the GLP is going to really help to rebuild that. That system that helps your body to recalibrate, if you will.

And could it potentially I mean, I'm guessing would it potentially mean that people need less. Yeah. Like they can do with lower doses. So and sorry and one more question before you get going again, is it possible that people started to naturally modulate how much they were eating and taking in as the pre biotic and probiotic were doing their thing in the study?

Yeah, yeah. So that was an interesting part of it. Right. So given that we did not tell them. So there's something called a the Hawthorne effect. Yes the hot tone effect is you know if they know you're they're part of a study on some sort of health marker, they're going to try to game it because they want to do better. Right.

And that's a that's a normal thing. So which is so what's important here is that we did not tell them what the study was about. We just told them it was a tolerance study.

This is a natural vitamin supplement. We wanted to see how people tolerated it. Right. Okay. That way we didn't trigger the Harlan effect. But what we did observe in our surveying when they came in, in terms of their behaviors and all that, we did see that the group with the treatment compounds naturally started becoming more active.

They walked more, they took the stairs more often than they than they wouldn't. You know, they kind of gave up

certain cravings like they would they would report, for example, I don't know what this vitamin is, but like, I don't have the cravings I used to anymore, you know, is that is that some new vitamin C derivative?

Totally. They were they were like, I don't know what this vitamin is you're giving me, but could it have anything to do with my cravings being less like, no, no, that's not a known effect of the vitamin, but if you're craving something less great, you know, maybe that's just a change you're experiencing. So.

So we did see that. And that does happen when you shift the microbiome. Right. Because cravings and all that come from microbes in your gut triggering certain neurotransmitters to make you want to eat stuff.

When the microbiome science first came out many, many years ago, there was an amazing article that was put out that was titled My bacteria Made Me Eat a cupcake, you know?

And it just like it encompassed this idea that the microbes in your gut can influence you to do certain things. Yeah. And so, you know, and so, so as we're changing the microbiome, we're starting to see changes in their relationship with food, which is a very important aspect of successfully utilizing.

And then coming off GLP one is you have to innately change your relationship with food, right? If it doesn't change, you're going to go back to your habits.

And that's the suppression and enzyme, right? Yeah. So so that's a that's a really important question I'm glad you asked it. Now the question about what do you do then.

How do you work on rebuilding the foundations as you're on the GLP ones. And the good news is the things you would do to rebuild the foundations are actually really great at mitigating some of the side effects of the GLP ones as well.

Right? So I think and I would absolutely say if you're if you're going to commit to doing some of these things, I would definitely start at the lower dose, most of these ones.

Right. Just to see how your body does if the lower dose is enough, you want to have this, what I call MVP mindset, right. The minimum viable product level of utilizing it.

And then if you feel if you get stagnant and you're seeing too many plateau, you maybe you need to bump it up a little bit. Right? But the start of the minimum absolute minimum dose.

So the things I would start doing, number one, I would start looking at adding in more fibers and prebiotics into your daily diet. Right. And the type of fibers you want to add is a mix of soluble and insoluble fiber.

Right. So the difference between those two for people to understand soluble fiber binds water. And when you consume it and it binds water, it gels up in your gut.

And that gelling is a natural slowing down of your gastric emptying, which is similar to what GLP ones do. And as a result of that, makes you feel full, faster and easier.

So one of the things I do in practice anyway is as often as I can remember, it is before every meal I take 5 to 10g of a soluble fiber about 15 minutes before a meal, mix in water and you drink it down because that's going to go in, swell up in your stomach, and then it'll cause you to eat less inevitably, right?

You're going to feel full much faster. And the other benefit of it is if you have any insulin, genetic foods in that, in that meal, it completely blunts the glucose response, right?

The spike, you're just very powerful and really important for your insulin resistance issues. Again, another aspect of GLP wants. Right? Yeah. Can we give people an example of what that soluble fiber is.

Yeah. So a non fermentable and I'll talk about fermentable and non fermentable soluble fibers a great non fermentable soluble fiber that helps do that is psyllium husk.

You know psyllium husk. This is why. So Metamucil is like the most kind of generic commercial version of psyllium has. This is why they have an FDA approved claim on lowering cholesterol and all that because of that soluble function.

And it and it reduces absorption of certain food products like like fatty acids and triglycerides. And then it also improves insulin response. So the most simple way 5 to 10g of psyllium has 15 minutes or so before your meal.

Mix it in water and drink it down. I like I use a product called balance, which comes from a company called unicity. The reason I like that one is that it has a variety of soluble fibers.

And some of those soluble fibers like, like partially hydrolyzed guar gum and all that are also fermentable. Now, what does that mean? That means that not only are they going to swell up and give you that effect, when they make their way to the large bowel, they can actually be broken down by beneficial bacteria and produce short chain fatty acids. Right.

So psyllium husk is good at the the swelling thing, but it's not very fermentable is that you need a variety. Yeah I needed you said that. That's a key. Yeah.

And I think that what's important for people to understand also is start low. If this is all new to you, don't go and do a two teaspoons of psyllium husk in water. You will be sad.

So maybe started with the spoon and you got to drink lots of water folks. Hydration which is also can be dehydration can be an issue with the. It's also massively important to your gastric motility.

And if you're going to use these fibers you need water or you're just going to build a plug which nobody wants. So sorry, I just kind of had to put in that little PSA.

No, no, that's really important. Yeah. With fiber you always want to build it up. You know you're because there's a utilization factor with fiber as well right.

If you're if you're not training your microbiome to expect more and more of these kind of fibers coming through, you'll you'll have fewer organisms that can actually break them down into healthy compounds.

You might get more breaking them down into gas and things that are that are uncomfortable. But but generally, if you start doing just this one thing alone, you're you're hedging your bets that you're going to improve your metabolism significantly while you're on the GLP one.

The other part of it is, you know, I mentioned two different categories of fiber soluble, which we just talked about. And then insoluble is the other one.

Now insoluble fibers are don't bind water. They move right through the system. They actually speed up the movement of your bowel, not gastric emptying but the movement of your bowel and what they, what they they can also be fermented.

But what's good about them, in the case of GLP ones, is that one of the most common side effects is this constipation, right. And it gets very uncomfortable for people.

So this insoluble fiber can help kind of move and speed along the gas. The transit time so you don't feel as constipated. So insoluble fibers are things that come from like nuts and seeds you know.

And so and you can just Google sources, great sources of insoluble fiber, vegetables and some vegetables. Certain vegetables have a lot of insoluble fiber.

And so I would just Google it and kind of look at what are the things that you don't mind eating that have a good amount of insoluble fiber. You don't need a lot like 4 or 5g, you know, will help a lot.

Right? So the way I would do it is I would do the soluble fiber 15 minutes before your meal. Right. And then that gives it a head start. And then with your meal I would do the or at the end of the meal I would do some insoluble fiber just to help push things out.

As your your system is trying to ferment and move the food along through. So those just those two things alone can, can really help. Polyphenols are really important because polyphenols feed a lot of good bacteria, especially the metabolically important bacteria like.

Plays an important role in insulin response, in metabolic health, in fat burning and acrimony here feeds off of polyphenols. So what are polyphenols? They're basically come from colored fruits and vegetables.

Right. So berries for example have a very high concentration of polyphenols. So blackberries blueberries you know cherries and so on I would encourage people to eat roughly, you know, and this is going to sound like a lot, but it's actually not like half a pound of berries at a time.

It sounds like a lot. But remember, a pound is like no 150 cherries. Let's just be clear here. Cherry had a lot of sugar. So you want the raspberry strawberries, blueberries, blackberries.

Those guys? Yep. Who's going to have a few cherries in there? But not dominant? No. Where you can get cherries some and get the benefit of it is from the tart cherry juice. You know, you can take a shot of that. Yeah.

It has the cherry based polyphenols and also the compounds that the flavonoids and all that help mitigate improve the insulin response without all the sugar.

That's it. But but blueberries, blackberries, raspberries. Fantastic. You know, you'll see if you ask AI how much is a pound of it. It's a small bowl. It's not that big.

And so I would do that as kind of your dessert. Like top that off right top top it off. And that's what I've been trying to practice for myself because I always like a little bit of a sweet ending to my meals. Right.

And so I've been trying to find the healthiest version of sweet endings and berries. Just kind of do it. And if you if you have to, if you have a sweet tooth and you have to enhance it, but put a little drizzle of honey on it, you know, just to give you just a little bit of a sweet thing.

Just a tiny drizzle a bit. But but that works amazingly well for me. And the honey is not going to have a big insulin response because you've had the soluble fiber, you've had the enzyme, you've had all of this stuff before the meal.

So the response is going to be completely blunted. They're not going to be spiking your blood sugar if you do that. And I've done these tests on myself with the CGM, looking at what the glucose response is like when you eat this stuff before or after your fiber meals, right?

So if you're getting the fiber and the polyphenols, you already have two of the three biggest components intact already. The third dietary component that you want to get are probiotics.

Or if you can get some good fermented foods, that's great as well. But the probiotics, like the spore based probiotics, that's what we studied in these studies.

I talked about the leaky gut gut brain study and then the obesity study. Both of those were were simple probiotics that were endospores. Right. So one of the main strains is a Bacillus subtilis H2 58.

So if you look at that from companies like just Thrive you know, you'll find them add that to their. Yeah. And it just it just absolutely is a great combination with the fibers and the polyphenols to start to fix the gut microbiome.

So you're starting to do this now. Then the other aspects of this is you want to make sure that you're you're lifting. And I'm sure you've probably heard a lot of people say this, the resistance training.

But I'll say it from the perspective of the gut. The resistance training is super important because of course, you you know, people will lose upwards of 40% of the weight being muscle lean muscle mass.

That's not going to be good for your metabolic health. You need to maintain lean muscle mass, which means you need adequate protein with the with the lifting.

And most important, in the protein you need Lucy, you need high levels of leucine, right? Because leucine is a trigger, meaning it triggers the building of muscles.

I also use a compound called hydroxy methyl butyrate. Yeah, right. Yeah. I found that to be very effective for me. I see and feel the difference in muscle tone and mass and gain and then maintenance of it when I travel, say, you know, two weeks and I can't lift very much.

I see the maintenance of it much significantly so. And the studies on HMD are very much in that sarcopenia. Yeah. Area for older adults. And that's kind of what's happening when you're on GLP.

Once you get becoming sarcopenia, you know. So I would use the create teams the the high leucine amino acids and then lift. Now from the gut perspective why is lifting important.

Well two things. Number one lifting reduces anxiety right. So it does burn off cortisol and it does reduce the effects of anxiety and stress. Stress and anxiety are one of the biggest drivers of leaky gut right.

So it counteracts that if you struggle from that. And a lot of most people struggle with that to some degree. So it's a good way of burning off that nervous energy.

The second reason is when you lift, you release these chemical compounds called myoclonus. And some of these kinds play an important role in fixing the lining of the gut.

And they also reduce inflammation in the gut. Right. So as as surprising as it might sound, lifting weights, contracting your muscles has a very positive effect on your gut.

And you've got lining. And six that leak eagerness to the gut. So the lifting gives you multiple benefits when you're GLP ones maintaining muscle, maintaining basal metabolic rate, and then maintaining the healthiest version of weight loss, but then also fixing your gut through managing stress and also directly producing myocytes.

Right. So so those are those are some of the keys. And I think if you start doing that and the other aspect of it I would say is really work on altering your relationship with food while you're doing this. Right.

So a lot of people overeat. And I would say, you know, I would say well, over 60% of the people overeat because food is a dopaminergic substance, right?

It releases dopamine when you eat something that you find delicious and craving. And it makes total sense. I mean, your body wants to reward you for for back in the day, going out and making the effort and facing the dangers to get food.

Yeah, right. Evolutionarily, that makes sense because you had to leave the cave and you have to go out in the dangerous world. And so it has to motivate you to go do that to in order for you to survive.

And so the dopamine system is very much connected to food. So for people that have connected dopamine and food, that becomes a very easy overeating pattern.

And then also a craving pattern, right? When you're having low dopamine, you actually start to crave food as a

dopaminergic substance. So one of the things that GLP do that is really fascinating is it actually takes the desire of food away, right?

Especially the triple agonist now like the writer true tides, because one of the side effects of a true tide is actually Anatolia, which is this loss of joy and everything.

Right? Because it's taking that craving away, that dopaminergic drive to do something. So one of the things I would work on, an exercise I would work on is, you know, recreating your macros in your meal.

Right? Because you're now you're doing it because the craving part and the, the psychological part of the, of the bond with food is dampen. Yeah. This gives you an opportunity to reframe how you think about food.

Right. So you think about food as fuel. And I want you to be very conscious when you're about to submit the meal. You're doing the soluble fiber beforehand.

You're taking a meal with high protein in it, because now you know you need to do the protein. You've got polyphenols in there.

Repair Peptides and Reducing Inflammation

You're being more conscious about what's on your plate for the reasons we talked about. Meaning you're fueling certain systems within your body. You're thinking about fueling the keystone species that help you in metabolism.

You're thinking about the fermentable carbohydrates going in there and feeding all the gut bacteria. You think about the polyphenols feeding and your mitochondria and all this stuff.

You're thinking about the protein feeding your muscle cells and inducing muscle genesis. And and as a result, you can reframe your relationship with food, where food is a fuel and it's not a drug.

Right. And it gives you the opportunity to do that because it's taken away that drug like addiction to food. So I want you to be extremely conscious of that every time you sit down to eat and frame that and put that in your mind.

Because remember, neuroscientists always say, you know, you create your own reality, right? Your body responds to what you believe, and then you start looking at your meals, and you believe that there are fuel for certain aspects of your body.

That's how your body will start seeing it once you start coming off the drugs. Right? So really work on that reframing. Yeah, that's such a powerful message, Caron.

I think that I don't know that. I mean, a lot of people talk about this. We all do. But I've never really heard it articulated quite this well before.

So thank you for that. That's my pleasure. Yeah. No, it's one thing I was not. Yeah, totally. You and you have to do it right. So and if you're not repeating it to yourself, it's almost like a mantra you want to do in the beginning.

It becomes automatic after after a little bit of time. But if you if you visualize, say you visualize the soluble fiber going in, expanding in your stomach, slowing down everything, causing your brain to go, oh, I'm kind of full, I don't need to eat too much.

And then making its way down, and then all of these beautiful bacteria are eating away at it, making these important compounds for your immune system.

Like literally visualizing that stuff happening. Right. Connects that for you neurologically. So that that's how you start looking at food. Right? So so I want people to be very deliberate about that.

I do want to give them a couple of things because you'll naturally eat less by volume. The other risk is that you start becoming nutrient deficient. Yes, because you're eating less. Right.

So I want people to be really conscious of we already talked about protein, but the other one is iron, right. So people can become anemic, especially women.

Women are already at risk or anemia in fair can levels can drop quite a bit while you're on GLP ones. One of the things to consider is something like lactoferrin, which is right, which is a really important compound.

Yeah. For for balancing iron. So not just taking iron because you don't necessarily utilize iron really well or absorb it very well. Use lack of Farin which helps you actually absorb the iron properly.

B12 a lot of people become B12 deficient and then fully is another one as well to think about. And then magnesium. You do want to make sure you're getting adequate magnesium and taking it in a supplemental form, and then vitamin D3 and K2, those are both also important ones to make sure you're getting supplementing with it as well.

So I think if you do some of these things, you can utilize the amazing benefit the GLP one agonists, GI ones and glucagon. Agnes can provide you and use it as a tool, not a crutch, you know, and then and be able to come off of it once you've reached kind of your goal weight, and you may be able to do it the entire way with the lower dose, and then you're also reprograming and rebuilding your endogenous systems that will help you maintain the healthy metabolism afterwards.

Right. So it takes this work. Yeah. It's and you know, and that that turns this into a reprograming instead of just a weight loss season. Right. Yeah.

And we're we're seeing it all over the place, people bouncing around constantly. So that doesn't leave us a lot of time for our anabolic section. Yeah. Do you want to do.

Are you is it fair to say can you do a ten minute crash course on the the landscape for the repair peptides and then just leave it at that and then we'll just do it in five minutes okay.

In five minutes. Yeah. Okay. I mean I think spending the time on the, on the body composition and frankly, everything that you do here is going to help on the other on what we're going to about to talk about now anyway.

So that's exactly right. Yeah. Because everything that went wrong with your gut was is the biggest reason you have what we call chronic low grade inflammation and chronic low grade inflammation is an elevation of these global inflammatory cytokines.

Right. When I say global I mean they're in circulation throughout your body. And they trigger inflammatory responses everywhere in your body, including in your tissues, your joints and so on, areas where you might get injury and the lining of your gut as well.

So if you take a peptide like BPC 157, you know, it was discovered it's a synthetic peptide. It's like 15 amino acids, but components of it were discovered from a peptide that exists in your gastric juices.

Right. And more than likely that peptide gastric juice is there, designed to trigger repairing of the lining of your gastric system, which consistently gets damage as you eat food and microbes and all that are getting in there.

So it is a peptide. Now, the you know, keep in mind there's no human clinical trials on this. So most of the evidence comes from, you know, in vitro like modeling studies or animal studies, what is known about BPC and TB 500.

And they're bit different in terms of how they work. But generally what they're doing is they're trying to trigger reparative mechanisms in your body.

With BPC, there's a lot around the nitric oxide system and and something called NGO genesis. Right. Angiogenesis

is a building of new vessels. One of the big problems when you hurt yourself or things get damaged as you get older is we are much more in a catabolic state.

Right. So when you're younger. So for people that aren't familiar with that term. So catabolic means to break down. Anabolic means to rebuild right. That's why bodybuilders are taking steroids.

Those are called anabolic steroids because they build things. So when you're younger and you're still growing, your anabolic system is way high. You're constantly building and rebuilding.

That's why if kids get a ligament tear or a soft tissue injury, it can heal in less than two weeks. Yeah, right. Yeah. It's nothing. It's nothing for them.

They can also, you know, run around all day long and then sleep eight hours and then wake up the next morning and be completely fine. They're not saw that.

They're not saw when you do it. If you do that when you're 50 you'll be out for three days, right. And so like all of those, all of the things that we, we experience in aging, like decline in cognitive function, decline in vision, you know, decline in muscle strength and function, everything in your body is declining because of a degenerative process, which is a catabolic process.

So what happens at some point in life? You've got anabolic processes working really well and repairing and building everything all the time. And at some point the catabolic process, which is really a base base layer process that starts to accelerate and then takes over.

And usually when you start hitting your mid 30s and beyond, the catabolic process is higher than the anabolic process. So recovery and all that is really, really hard.

The thing that drives the catabolic process though is chronic low grade inflammation. I do all of these talks and all these conferences like anti-aging conferences and all that, explaining to doctors how the cells that were responsible for building stuff.

So take the cartilage in your joints, for example, there's a cell called sites that are responsible for building and repairing cartilage. Those cells not only stop building and repairing cartilage when they're inundated with enough inflammation, they actually shift to a catabolic cell and start breaking down cartilage effectively, right.

This is why so many people experience osteoarthritis and joint disorders, because the cells that are responsible for building and maintaining their joints are now actively breaking them down. Yeah.

Now let's say you injected BPC 157 into that kind of joint that has a high catabolic rate, lots of low grade inflammation.

Where to Find the Recommended Products

It's going to start to try to trigger the reparative systems in that in within the joint the and your genesis and the tissue remodeling and all that. But that's going to be overcome by the overwhelming catabolic processes that are already going on. Well, you've got to yeah.

You got that battle is there. It's ongoing. Right. And so the success of these types of peptides will determine will be determined by what that terrain looks like, how catabolic you are to begin with.

Right. So one of the ways in which to give those peptides a chance to trigger the repair signals is to reduce that chronic low grade inflammation. And most of that comes from your gut anyway.

Right. And so we did a study 2000 subject study on a on a straw using herbal compounds. And what we were looking at was herbal compounds that can bring down these global inflammatory markers.

And what we showed in that 12 week studies that when we bring down the global inflammatory markers, the joints can repair itself. Even people who are bone on bone osteoarthritis for years had new cartilage regenerated in their late 60s.

Really? Yeah. These are both published studies. Almost two. I did that study. I need to get reading. Yes. Yes, that this is a this is a product that we developed called cardiogenic.

And it's absolutely phenomenal that the body has the ability to heal at any given time. You just have to create the environment for it. So anyone's thinking about, you know, TB 500 BPC, they they're all reparative peptides that are dependent on the repair mechanism in your body.

They stimulate it, but they can't do the fixing or, you know, without the repair mechanism functioning. And the repair mechanism is inhibited by chronic low grade information.

So in fact, everything we talked about on the GLP one side about fixing the gut applies right here, because that's the primary way in which you stop the chronic low grade inflammation.

Yeah. That is that's amazing. That's how you can do it in five minutes. Yeah maybe ten. But no, but that's but you know, like you can't you can't repair in the middle of a forest fire.

Like it just can't happen. That is such a powerful. So the cardiogenic is the is for the cartilage regeneration soft tissue. Yeah. Okay. So we can add that add that to your stat guys because it'll just it'll enhance.

Absolutely. You won't need as much. You won't need it for as long as you'll get better results. Yeah exactly. And then it'll be sustaining. It'll be long term results. Right.

Because the thing about the repair, you know, mechanism. Right. So the BCS and all that will induce a repair signal but it doesn't induce a maintenance signal. Right. Right.

So so you need that maintenance as well. And bringing down that, that chronic low grade information allows the maintenance. Because the cells that do the fixing will only do the fixing and maintenance in a low inflammation state.

Perfect. All right. Sir. Caron Krishnan. Well, thank you for knighting me. We bow you to you. We bow. Are you complete? I mean, we could, you know, obviously there's a lot more where that came from, but I think that was a really beautiful presentation on helping people to make best use of these things.

And so anybody who was scratching their heads wondering why the microbiome guy was at the fire regulator Peptide Summit, hopefully we've squashed any real questions about why that would be appropriate, because I think ultimately this is about how do we get these compounds to work better.

There's an argument that says in some cases you may not even need them if you do the right, if you put the right things in place, but if you still want to use them, then you're going to get way better, much longer lasting results if you implement these strategies.

So Caron, thank you so much for this. Today. You want to help people understand certainly for the probiotic where they can get their hands on it. And and I don't know if you want to give a reference on the cardiogenic so people can just go hunting for it.

There's not much we can't find on our own these days. So yeah, no, I'm happy to to provide people where they can go find these things because they're going to be really important tools for them in their journey.

So the probiotic that we talked about, you can find it at Just Thrive Health. That's a I had actually developed that probiotic. So I know it might seem like I'm biased but we published studies on it seems like universities.

Yeah. You know like these are done by third party universities. And so it works amazingly well. The fibers and all that. You could source it anywhere you want, you know, soluble in soluble fibers.

As I mentioned, I used the product balance. I don't have a financial relationship with them or anything. I just find it to be a very easy, great product to use.

And then the cardiogenic is by a company called Cal Roy Health and it's in the market. So if you just Google cart I'm sure it'll be in the in notes and things that that you might add on that.

And so that product is fantastic. Absolutely. Like I mean we have so many studies on it. As I mentioned, clinical trials alone, we have over 2000 patients in it and these all published in peer reviewed journals.

And then finally, if you if you want to learn more about the microbiome and how to handle it, just come to my biome learning center. It's at biome Bio MLC.

Com and we have a free circle membership. And we'll provide you with resources and all that on how to tackle your microbiome health. Right. Which is an underlying component of everything you do.

Beautiful. Thank you. Thank you so much, Karen. My pleasure. Total pleasure to spend time with you. Thanks so much.