Introduction to Dr. James LaValle

Welcome back to the Bioregulator and Peptides Summit folks joining us today in we are so lucky to have him is Doctor James LaValle, a clinical pharmacist, board certified clinical nutritionist and one of the most respected voices in metabolic and integrative medicine.

He's got over 40 years of clinical experience. James is the author of over 26 books, including the landmark Cracking the Metabolic Code, which I'm pretty sure is one of the first books I ever bought long before I was in this space.

And he's the mind behind the metabolic code, a model for uncovering the hidden barriers to true health and longevity. He currently serves as Chief Science Officer at Lifetime, chair of the International Peptide Society, and he's the clinical co-chair of the American Academy of Anti-Aging medicine, otherwise known as a forum, along with adjunct faculty roles at the George Washington University School of Medicine and for nearly two decades, the University of Cincinnati College of Pharmacy.

He's been named National Clinician of the year and a Forums Educator of the year, and recognized among the 50 most influential pharmacists in the country.

Now, given his leadership in peptide therapies and metabolic health. There's truly no one better to help us dig into the science of these small molecules.

We are so lucky to have him here. So, you know, busy executive, you know, phones going off, pagers going off. I'm busy. Get me through this mess. And then he gets through.

The end of the day, he's told that he has a coronary artery calcification score of plus 700, which is pretty big, right? He's pretty clapped up. And he gets back to my crew, which is now going to do the lifestyle nutrition support.

And the first thing he said to me was, he comes in like a tail dog with a tail between his legs and he goes, I'm not going to have to eat tofu, am I? And.

And literally not, not, not the tofu is bad. I guess if you if you air fry it or something, I don't know. But anyway. But the point being is, I think a lot of times people don't understand that.

Yeah. Their numbers come back and they're shocked. You know, many times they're shocked at, you know, their homocysteine is elevated, their C reactor proteins up, their insulins out of, you know, it's kind of trending in the wrong direction.

They're making a bunch of bad actor lipids or kidney functions off. This is what I see all the time. It's not like it's a rarity anymore. It is commonplace.

And I think it's because people don't understand meta formation. You know, we've been taught you're if you're thinner, you're like, hey, my metabolism is good.

And, you know, metabolism is really the sum total. All the biochemical reactions going on in your body right now that have been created since the time you were born.

All those pathways in your mother's womb to now create your expression today. And then it is influenced by what you do to yourself, right? How we eat, how we exercise, how we sleep, how we stress, how we love or not like all that stuff.

And then what the environment does to us mold, bio toxins, environmental burden, glyphosate, Badwater or whatever. Right. And so because people don't think of it that way, they just don't look under the hood and, and get that lab test and see what's going on.

I mean, just like basic advanced labs, I'm not talking about, you know, going and asking for a toxic metal test or a pesticide test. They don't even go and get things where they look at their advanced lipids, or look at their C reactor protein or their homocysteine.

And these are core things that we know if they're elevated, you are accelerating your aging. I mean, that's the funny thing I've got about all the other stuff, like biological age test, I think they're still being perfected.

I don't think they're there yet. But here's what I know. If you're glucose is spiking up and down by wearing like a CGM monitor, or you have a glucose above 90 fasting, that alone means you're probably going to be shortened in your longevity quotient.

Just that a pretty low bar, right? Like the continuous glucose monitor, I think is one of the most powerful tools people have at their disposal, just as a source of data.

Metabolic Health, Stress, and Hidden Lab Markers

Right? Yeah. And I think where people get into trouble is it's even like with sleep scores and stuff, they take it as a judgment and it's it's. Yeah, exactly.

You know, like it's it's a data point. And I think that especially with your high, our high performers, these are people who they're doing a lot right.

But they're doing too much too hard and right. Like honestly, you know, I like, look, I just got really sick for a month. And if I look back at the runway that led to that sick and it's not a direct line like lots of other things contributed to this, right?

I didn't know what it was like to have personal time. Yeah, I said me some shit. Like I did not know what I forgot what it's like to cook a meal for for my family or to stop.

That's huge. Yeah. I mean, you know what? I had to learn that, you know? But, you know, I'm older than you, so I'm just telling you from the wise old man in the sea here that I know.

Honestly, I had to. I had to learn. You know what? After. Because I get up early, you know, I'm still getting on it pretty early. It's like there's no good that comes out of my brain after 630 at night.

I'm going to shut down, cook dinner, sit down, relax, let my brain cool off. And I had to learn that because I was big. I was one of those, you know, I mean, I wrote 26 books.

I mean, you know, it's like one of those people, right? You know, five databases. I mean, it's like, what can I do next to show that I'm smart, right?

And not, you know, and not realize there's more to it than that. And I think the high performers, I just know when we had the living Longer institute people that we see would retire because they were like running like a bull.

Very successful many times within two years ended up in a like a coronary event or another event. Yeah, yeah. Like the system falls apart because I think what happens is it gets over, it gets you.

Don't you know, I came up with analogy for the human body and tell me what you think. It's like a giant Jenga game and. Well, and so you're, you know, as you go through life, the little you're poking and it's a bit more confidence, you know.

Right. But you're building you're building weaknesses. But the cool thing about the human body is it compensates. And it'll rob Peter to pay Paul any day, to keep, to keep giving you what you want until that.

Right. And I think that that that nervous tension, that over performance that go go go go go. It's like this electricity that keeps things moving more than they should.

And all of a sudden when you stop, there's like a coming of like there's a, there's an accounting that happens. Yes. And I think that's very well said.

You know, it's. Yeah, I've spent a lot of time talking about the nervous system these days, like parasympathetic sympathetic tone. And people get stuck in sympathetic tone.

And your sympathetic nervous system is supposed to be kind of a pulsing nervous system, not a full on nervous system. And so when you stop that run for the white tiger, you know, hey, I'm retiring.

Well, now your body's no longer being asked. It's like asking a racehorse to run at full speed forever. Right? We don't expect a racehorse to do that because they break down and then they get either they get into Glue factory or put out.

And that's what happens with us. Because if we push too hard, too long, one of the values of peptides, one of the values of doing lab tests, eating better nutrients, biomedical hormones helps us put that dress back in the box.

If we're smart enough, you know, get the circuit breaker box, get get all the fuzes it blue turn back on. Yeah, but it still takes a you know, the biggest thing I try to get people to understand is there are no shortcuts.

There's no. And if we ever think there. Yeah. If we ever think there's going to be some fountain of youth pill, we're way too complex. There's too many inputs into our body.

You, you you do have to get back to that accountability. Like what you were saying earlier. If you don't do that and then apply sensible tactics that you can say, I feel better, I'll keep doing that, I feel better.

That's kind of how I know. I mean, honestly, I know it sounds wobbly. I have people coming to me all the time and bringing in like 30 bags of stuff they're taking, like, what?

Do you feel better? No, but they were so nice. Well, know that you're the only. The only metric we use is are your lives better and do you feel better?

And what are your symptoms? Are they going away? Are you sleeping better? Are you. Are you not crashing midday? Are you thinking clearer? You know. Do you still have your your your joint swollen still, you know, and I think we people are desperate out there.

And so they're just trying all kinds of stuff and we just lose that thought of, you know, we got to get our bodies out of that chronic duress and stress response.

And Xanax isn't going to do it. No, no, 100%. It's the above the line below the line. Right. Data is above the line and how you're feeling. Well, data is below the line.

And how you're feeling performing is above. So let's go back to your metabolic model, which is your you know, it's one of your big things. So you describe your work as finding the metabolic roadblocks.

Right. So there's these things that people bump up against. And sometimes they do what they're supposed to and sometimes they just keep bumping. So who was the what was the first patient pattern that you saw that made you realize that the system was just missing it?

Like they were just missing the point? Yeah. You know, it's interesting probably 1993, because I did my first lecture

on it in 97 and then wrote the book Metabolic Code in 2002.

And now the new editions coming out. I think I own you, a book from a long time ago. Yeah, yeah, it's a long time, but it's still very relevant. But because I don't think it's things have changed.

Here's what I found. Wow. So you're stressed out. Your cortisol is elevated, your insulin is up, your glucose is up, and your thyroid is down. You're tired.

You're gaining weight, and you crash midday. And now you can't control your hunger and appetite. And this is why. Because as cortisol goes up, insulin receptor sensitivity goes down.

You release more insulin, you store fat, and as cortisol goes up, you make more inflammatory compounds in your brain. And now all of a sudden you got neuroinflammation and cognitive cloudiness, mitochondrial loss.

And as cortisol goes up you lose T4 to T3 conversion. And now your cells can't power the mitochondria because you don't have by right hormone T3. And that's why.

And that was the like the the layup. Because I kept explaining to people why they had cravings. You know like the why does the reward cascade occur. Because look I mean it's the same as it was before.

Everybody was struggling with their weight. It's 42 is 40 years ago, 42 years ago. Everybody's struggling with their weight. Everybody's can't figure it out.

Exercising more and eating less wasn't getting the weight off people until they went into a starvation medical diet at 800 calories. And then they got ghrelin rebound, and then ended up eating their way back to being overweight again, you know, and and so from there, it just started.

I just started, you know, realizing that our body is just a system of systems, just as you had said earlier, you alluded to and you're only as good as your weakest organ.

Yeah. And you can't like, I just saw something come out, which it was on YouTube or something, but it was a presentation on the heart gut kidney connection. Right.

So there's all these connections you can make. I just modeled it in a way that was in the literature. So, you know, adrenal, thyroid, pancreas is about cortisol insulin, glucose and thyroid hormones and then got immune.

Brain is about the relationship between the crosstalk signaling between the brain and the gut and the immune system being the mediator. That and when it gets skewed, moods change.

Inflammation occurs in the gut, gut gets permeable. More allergies, more inflammation. You know, you trigger your your your microglial cells in your brain.

So what I did was I define these networks, looked at labs and had all my grad students for about ten years look at things. Yeah, I love I love grad students.

Well, they're all smarter for I to I mean, look, at the end of the day. Everybody knows together. Right, exactly. No. It's great. And so what I did was I started to look at cross correlations because, you know, I love this thing of we test 200 things.

We test, you know, it isn't how many things you test. It's if you can identify the patterns of dysfunction within the labs. We're still a little archaic. Oh, your glucose is up.

That's bad. Your D is down. I'll give you that. And what I really set out to do was do what's called Bayesian modeling. Just accelerated lab pattern identification using five networks people learning phis and threes.

I, I partially did it because I wanted people to quickly understand what I was trying to convey to them. Where are you? Metabolically broke. Hey, you're adrenal thyroid, pancreas.

We call that triad one that's out of control. You got you scored high both on symptoms and labs, and they came together. And this is where you're broke.

And this is why you feel tired today. You've gained weight, you're sluggish, and you can't control your appetite. So what do we do for that person? Just to see if it's being driven.

So if it's being if it's being driven strictly by stress. Right. What what do we do. No other triads are involved. And I'll talk about how that progresses in a second.

Give them something to dampen their stress. So are you someone who's stressed in craves food, or are you stress and perseverance? If you persevere, rate.

You're more of a person, maybe an asshole gone to person. If you're a craver, maybe you need during the day. The biggest problem people do is they don't understand.

You have to dampen your stress all day long to not be running from a white tiger. So something like ashwagandha, holy basil. That's the dampen your stress.

If it's out of kilter, you're having cravings. If you weren't having that, hey, I don't have any symptoms. I just know I'm running really hard. That's more like the adaptogens, like ginseng and ashwagandha or ginseng and rodeo, right?

I'm protecting against the future break. And then if it's glucose and insulin, obviously. I mean, GLP ones are super popular now because people got too far.

They ignored all this and now they're glucagon was unopposed. But there's a lot you can do before that. You can get people on modified, low carb, low allergen, anti-inflammatory diets.

You can get them moving. You can get them getting their chromium peak magnesium and zinc. Several things will help. The ancillary receptor berberine can do it.

You know, bitter melon can do it. And then you can move to the PEPs, like if you need a peptide because you tried everything and nothing budged on your weight, well that and your glucose is still off.

You know, like nothing is working. Yeah, fine. Yeah. Move to it. Or if you're significantly overweight. And then of course for thyroid, a lot of times for me when we correct cortisol, when we correct cortisol, thyroid kind of comes back.

Because what happens is I think, you know, thyroid is the dog wagon, the tail. It's the HPA axis that's doing it right. It's the hypothalamus pituitary adrenal axis telling you.

Right. Like literally doing job. Yeah. Yeah. And you said it beautifully. Your body is a system of countermeasures. It'll rob Peter to pay Paul. It's slowing down your thyroid because the cortisol that's releasing the adrenaline is making your heart rate go up.

And your body's intelligence knows we only get so many heartbeats as males. So there's an intelligence to this that's there. And then of course when your stress gets bad enough and your gut gets permeable enough and now you're making more lipopolysaccharide in the gut, the lipopolysaccharide attaches to the thyroid and creates Hashimoto's food antigen induce thyroiditis.

So that's triad one. Adrenal fibroid pancreas stacking on triad two got immune brain. So what I try to do is just create more elegant ways for people to quickly understand how they can utilize integrative strategies.

Yeah. And that's that's the whole purpose of hey, fix this one that's broke and it may have a downstream effect on everything else. And what I've and you know, we've been fortunate.

It's it's so funny when I first adopt I first started talking about this earlier. He's like, oh my God this is so complex. Now everybody because of the last five years of kind of systems biology is coming around.

People go, wow, you made this really easy. It's the same, exact same program. I mean, we've created more and more advanced rules because as we learn and see thousands of patients doing it well, we're finding the rules and allowing that to happen.

But it's actually been great because what you're doing is every symptom could go into a buckets of different organs of the body, right. So when you answer that one symptom question, it's moving with different weight in a lot of directions.

Same thing with labs. And then what you're doing is you're you're pooling those labs together like a string of pearls. Your glucose is 95. All right. 60% risk of being diabetic.

But your insulins ten your C reactive proteins three your kidney your GFR your kidney filtration is 60. You have a 130 over 90 blood pressure. Right. You all and you're making bad after lipids your LDL particle size 2000.

Yeah. Everything's like I really better work on this insulin resistance because I just strung together all the things that says I'm way down the funnel, way down the funnel.

And that's metaphor. You may not be feeling anything, but you're already down the funnel getting ready to hit that inflammation. Because for all of the ballyhoo, we're going to live the 125 you know, all that excitement I can't get right now.

Metabolic Code and Systems Biology

We can't get an average person live past 77 in the US, and the last ten years is riddled with tons of meds that they aren't feeling really that great.

So can we please just start with moving the needle to an 80 year old, healthy individuals and average person? We get there and I'm all for living like I want to live long.

Sure it is, but sure. And who feels good? We're missing it. Yeah. No, I'm all in with you. So I love this. And do you think I. You're going to leverage AI to make this even more simple?

Oh, I already am. You already am. Okay, that's what I'm thinking. What am I thinking? I that's what we do. Yeah, yeah. Do is you have the black box and you leverage the AI over on over top of it.

So that because you have the complexity of the rules and then the AI gets to refine the rules. Because the problem is when you start with AI, there's so much crap out there that you start getting dirty.

Yeah, yeah, yeah, yeah. You got to be disciplined with the AI. But I do like you can like the good of AI is really good and the bad is really bad. So and it's going to it's like anything else, you know, it's like it's comes down to the person using it.

Absolutely. They have discernment and the knowledge and the wisdom to understand if they're getting crap or are they getting quality back. Okay. So where do clinicians and bio hackers both over complicate things and where they oversimplify it?

Where are you seeing this? Well, I mean, I think the bio hackers just think like, oh, I take this for this pathway and that's going to make it happen.

Whereas there's a convergence of what we've been doing, genetics and pathways that are going on in human beings. It isn't like I'm going to do these five peptides.

It's fixing these five things, and then I'm on my way. And so I think that's one area is over simplification of downstream and upstream events. I think also not far enough upstream and downstream like people only go so far.

Right. They don't go to I, they don't go to the end of the line. And if you don't understand the end of the line, not to mention the forks in the road, you can kind of create, I think you can create overexpression on one side, or you can create a block somewhat like, you know, like there's, there's we and I've and I'm and I'm going to speak from the inside because I would have been a bio hacker for quite a while.

I've stepped away from it to a point. And I think, and I've learned this from talking to people like you and Elizabeth and all these people that, you know what?

If you don't get the whole pathway, if you don't get to the end of the road, you don't get the pathway. And then you've got to understand what are the other inputs into the pathway, because the other things you're taking could be impacting those as well.

Like it's, it's, you know, it's it's both beautifully elegant and wildly complex. And to your point, the just take this so that you can do that and you stack ten of those on top of each other.

You've you've now possibly created a muddy soup that, yeah, if you're lucky does nothing or. Yeah, worth doing something bad. Yeah. But you know, I mean honestly what I found and I look, I, I work with two populations, kind of like high performing people that would kind of be their self-proclaimed bio hackers.

And I look at myself like pharmacy like a good like I was trained before. You're allowed to have calculators. We had to make all our own compounds. We had a we took.

Yeah, we had to take I mean we had to take where medicinal chemistry understand receptors. Right. I felt like I was trained as a bio hacker, but I don't really I'm not really that.

I'm just a clinician that is trying to figure out what receptors are on off and how do we turn them back to their proper position to create homeostasis.

It's not about. I think a lot of people will mess up. They go, optimize, optimize, make them loose mitochondria with them like racehorses. It's really about homeostasis.

You just want to create balance in your chemistry, because a lot of times people were taking things like mitochondrial peptides and they haven't even repaired the mitochondrial cell membrane yet.

They don't even. So they're just leaking a bunch of free radicals. And and you know, it's there once again, whipping that racehorse that's already ran two miles too long.

And instead of a step by step progression of understanding, what is the what are you trying to accomplish from top to bottom? Let's unpack that a little bit because I think that's really important.

Right? I'm going to jump around a bit here because we're not a side section. I don't care like when it comes to know because mitochondrial peptides are like my pet peeve, right?

Because Mozzie, on paper, you read about it, you're like, I want that, I need that. It's going to help me to lose weight. I'm going to be better at the gym.

Everything in my life is going to be better. Go get me in it. Fit me in it. How much do I take? How much do I need? And what you just said is so critical to the equation that the way I my you know, again, I'm talking analogies because I'm not a pharmacist, but and just for the record, I think pharmacists in this space are the most valuable

are MV Pete's because you guys get pathways so better than anybody else.

But you know, if your mitochondria to your point is not primed, it's like gunning an engine that's gunky. That's out of all that's full of junk. And our plugs are missing right.

What's happening? You're you're destroying the engine. So maybe we can help without going into, you know, exhausted tail, but help people to understand before you go gunning your mitochondria, because you may have mitochondria that's underperforming.

And to your point, we want them to over perform. We want them to just work because when they work they're freaking awesome. So so what what's the order of operations?

What are the steps people really need to take, and how do they kind of figure out what they, you know, that they need this before you go to the gunning the engine with the something like and I just want to bring up the reason they go to like getting the mitochondrial peptides right away is because at the bottom of the funnel of metal is the loss of mitochondrial biogenesis, you lose mitochondrial production, you have ragged mitochondria, you lose your NAD to NAD ratio.

And that makes you more prone. If you get a virus or a bug or an insult, you make more inflammatory cytokines right away, right? So that so at the bottom of the funnel is, hey, my cells don't make energy.

So yeah. So if you're so thinking about mitochondria I think I always start with phospholipids like your your mitochondrial inner membrane and outer membrane phosphatidylinositol phosphate title or the inner membrane choline outer membrane.

And it makes sense because if we have environmental burden or excessive inflammation, our cell membranes are getting damaged because of inflammatory signaling.

And that inflammatory signaling can come from being exposed to something like an environmental toxin, LED mercury and whatever mold, right. Anything. It could be a line, it could be excessive stress that is now broken my gut down and now I'm leaking.

I'm making lipopolysaccharide. The breakdown of the bacteria releases that into your tissues, and it attaches to your tissues and organs, and then releases the signal to increase inflammatory cytokines, which damage your cell membrane, compromise the signaling into the mitochondria.

And one minus is signaling. Because of excessive damage occurs, telomeres shorten. So telomeres in mitochondria are going like this. And so the first step is phospholipids repair the membrane.

The next step I would do is make sure I have adequate magnesium CoQ10. Yeah. You can obviously look at mitochondrial catalysts like your life in a if you want PCBs amazing and clean own especially if you use it in the in the micro version because it absorbs better.

Really good for acting as primers to get that Krebs cycle mitochondrial function moving again. Yeah. Right. So and there's other there's a few other nutrients to but those are key.

Yeah. And then once you get you kind of the membrane you're providing nutrients to the mitochondria that they need right. So we're feeding we're feeding.

And then you want to think about well what's damaged them to begin with. Did you take out take away the source of the insult because you can pump all the nad mo USC you want into somebody.

And if the source of the sources of the damage are continuing to play out, well, you're just going to keep getting damage. I mean, I think Henry Patel's me screen is really interesting because of it.

You know? I mean, I think it's interesting that it does a good job of scoring, like where your mitochondria kind of broke, but then but then the job is, you know, I was so fortunate to have mentors that screwed my head on right and said, do it in organized way, Jim.

Idiot. That's how they said it to me, literally. And it was it. Did they have bio toxins and mold exposure? Has it created epigenetic changes in the immune system that you need to fix on that?

First you need to soak up the inflammations out of the liver. What what do you need to do. Is it metals, pesticides you know, got dysbiosis. Is it all of it. Email you of it.

And if it is how order that correctly so you can unwind the source and you you can get by. You may need to support mitochondria when you're trying to get rid of the source activity, because you need mitochondrial energy in order to do and to run your immune system.

So that's where you think of, you know, you know, SS 31 or Motsi or NAD or or injectable nicotinamide ribose side. You, you start to nurture those mitochondria.

But you kind of have to repair the mitochondrial cell membrane, get the nutrients that it needs. Calm down. While you're doing that, you should be at least cleaning up like really gross inflammation signaling.

My cortisol is high. Because I'm stressed out and I'm not sleeping fine. Correct that right. Here. Take these things during the day. Here's what you do at night. Get your stress under control.

Get your glucose under control. Get your insulin under control. Get those main drivers of meta inflammation under control because they may not be ready to do like serious detoxification yet like it's a process to get people there.

Now sometimes people are in really bad shape. They have Parkinson's or which, you know, obviously a mitochondrial disorder, right?

Mitochondrial Repair and Recovery Priorities

They have Parkinson's disease or they were getting ALS or dementia. That's when it's really in bad shape. And you may not have the luxury of, you know, doing it step by step.

You got to jump in faster, harder, make more dramatic, you know, you know, programing to help that person. Correct. But I think the biggest thing that we see is people go, oh if taking my C's good.

Taking Motsi with SS 31 with NAD with CBN two for one. One is gotta be good right. It's like more more and more and more and well and I'll take a higher dose or I'll take it.

Yeah. Or I'll take a higher dose. I'll take it more often or whatever the case may be. So all right I know we're not talking about quick things, but if you have a quick win lever for the person who's kind of stuck in inflamed right now, like their sleep or is it sleep, is it glucose, glucose control recovery or the stress physiology.

What's what's the for the person who's the number one thing driving it. Because you can't because you can't separate. As soon as your stress is out of control, your glucose is out of control.

And if your glucose is out of control, you're driving more cortisol. Because every time your cortisol, every time you eat and you spike your glucose, you spike your glucose.

The most inflammatory event that leads to heart disease is postprandial spikes in glucose. And cortisol is released at the same time. So there's so to me, like if you take out environment, what we've lost is eating.

You know, first of all we eat too much. We eat too often, we eat too late. We picked the wrong foods. We don't move. I mean, we jump on our golf cart, jump on our golf cart to go get the mail at the end of the driveway, right?

I mean, we order our food. We don't even go to the grocery store and walk around, right? I mean, it's crazy. So I think back to living like the human.

You know what? We talked at the beginning. You know what? I'll tell her. I'll tell you. This is another I can't help because. Cracks me up. Got this. Whoop.

I'm always doing this stuff because of my role at lifetime, being a two science officer for a lifetime, I'm always looking at all this stuff. And you can get wound up in this and, you know, it's like, it doesn't matter what I do.

I can't get to the 100% sleep thing because I never sleep more than seven hours. Seven hours is my sweet spot. I'm 95% efficient. I sleep stress free.

Why am I worrying about getting to nine hours? That stresses me out. But. But anyway, I get my I do my workouts and I have a strange score on a hoop. They give you a strange score and yeah, it's 1716.

Maybe a hard work out. 18 I buy a house. It's got a fence around part of the backyard. I have this big zero radius turning works. It's a pretty big property.

It doesn't fit through the through the gate into the backyard. Yes, yes, I love that thing. Yeah, exactly. And I so I bought a writing. I mean, I bought a push mower.

I thought I'm going to get a push mower, I'm going to push mo. And I just really because everybody used to push mow. Everybody used to have a lot more about the push.

I got done push rolling, and my strange score was just as high as if I had done a moderate, slightly hard workout because I kind of fair amount. But you see, that's what we've cut out of our life.

Yeah, I remember I, you know, if I wanted something, I had to walk about a half a mile up to the corner store. I had to cut the grass. I rode my bike. Right.

We don't do any of those things now. And I think that so lifestyle combined with, you know, stress, blue light like emails. People say things on text, you get all wound up and you take it out of context and you're like jacked up at somebody.

We have all these triggers and buttons that hit us, man. I mean, the, you know, everything from that to traffic. Yeah. The stress response to me is the beginning of metaphor for most people.

Yeah. I think I would agree with you there. It's it's the root right and primitive nervous system in a modern world. And frankly, it drives the eating sometimes.

And like, it's the thing that it stops you from sleeping. It drives the eating, it paralyzes you, whatever the case may be. So I think I will. I'm gonna I'm gonna concur with you.

So if you only had five markers to spot early inflammation risk, what makes the risk the list? I think we've already talked about this. So you can go through this really quickly.

Cortisol even morning cortisol doesn't have to be a morning cortisol before 9 a.m.. Yeah. Glucose insulin C-reactive protein and homocysteine because the other ones that I think are important all were a reflection of when those ones are bad.

So your kidney function goes down when cortisol, glucose and insulin and homocysteine are up. Lipids get bad when you're insulin resistant and you make a lot of cortisol, right.

So a lot of the other inflammatory markers to become like downstream from those, you know. Yeah. What about DHEA. Talk to me about that. I mean I love the he is a is a marker because it's because obviously if your data is

good, it means your brain is being protected from the ravages of elevated cortisol.

Right. The DEA protects, you know, the hippocampus from being damaged by cortisol. So when data tanks, it means that a, you're using up your reserve to make sex hormones and protect your brain because you're using it for cortisol, you're using it for sexual moans, you're using it for metabolism.

So when it goes low, I mean, I think it's an important marker DHEA sulfates an important marker. Yeah. And so that's that ratio between cortisol and DHEA.

Like if cortisol is high you need that DHEA there. And then the big thing I tell people is when it gets bad enough the court that the ratio gets low because your cortisol, your awakening response drops and you're out of data.

So it's kind of a biphasic thing, right. Where initially the cortisol to data ratio when it's really big is bad. No. Yeah it's bad. And then but when at the end point at the end point right where that's low, that's really bad.

That means the immune system is a mess. You know you've got your neutrophils are low. You can't respond to an illness. You find yourself run down from working too hard not taking any personal time.

And then all of a sudden something hits you and you go wow. Yeah, yeah. That's interesting. It's funny, we don't talk about Da that much. And it's it's a very interesting little molecule that is plays a big role.

So we talked you mentioned advanced lipid markers before. I'd love to like unpack those a tiny bit for people before we get to our next section. So little a Appleby LPL two like when do they when when do you see those things.

And you're like, oh this this we got a good. Yeah. So I mean once again LPA somewhat hereditary. But I don't agree that you can't change the number. I mean I've seen plenty of people where we changed their lifestyle, got them on nutrients, got their insulin resistance under control and that number dropped.

Interesting. So so you look at it lipid particle size the size of your LDL cholesterol pretty important. And the way I explain it, it's like you have a tennis net on the inside of your arteries and it's tennis net.

And how many softballs can you throw to a tennis net? Not many. Yeah. And then how many baseballs can get through a tennis net? Yeah. Still not many unless you throw really hard.

What about a ping pong ball? Yeah, well, ping pong ball might get through, but what if you're throwing into a tennis net? Yeah. And so LDL particle size, the more that you make inflammatory chemistry, the more insulin, the more cortisol, the more insulin resistance, the more BB sized LDL cholesterol you make.

And you can just throw them right through the inner lining of the artery. And when your cortisol is elevated and your sympathetic dominant, you make more inflammatory macrophages which attack that lipid that got in there.

And then you create calcification. So the particle size is important. That's one. Yeah. Now the lipoprotein fractions are a reflection of inflammation.

So apolipoprotein B is a pro-inflammatory lipoprotein. So you don't want to make a lot of that. But it's the same issue. It's like you know and look one of the things that happened it's age dependent is women lose their estradiol and progesterone and testosterone and men lose their testosterone as they're aging.

That's influencing a lot of this, too. So, for example, even women not to digress, but even women for for mitochondrial function, estradiol is critical to function.

Yeah. No, I mean, so so the point being is hormones start playing a role in these Vance lipids. So then you have LP two, which is kind of a carrier for oxidative compound.

The best way to think of it it's a bucket. It's trash bucket. And and you know the higher that is and I tend to look at it

like, hey, if you're approaching the like upper third, lower fourth quartile of normal, it's kind of getting bad.

You know, the way I always tell, I try to give it to people. If you're a mile away from the Grand Canyon, you take a single step. It's not a big deal.

Take a single step when you're a mile away from the Grand Canyon. But if you're on the edge of the Grand Canyon, you take that same single step that not such a good outcome on that single step.

And that's how your labs are. So how close are you moving to creating more catastrophic issues and and so, so LP two you get up in that fourth quartile.

It's like, hey, we ought to be cleaning up that insulin resistance. Where is the inflammation? Where is the metabolic inflammation coming from that's driving the production of these bad actor lipids.

Now lipoprotein little A is gained a lot of popularity because it turns out it's an independent risk factor for an acute event. You could have perfectly clean blood vessels because we're brainwashed into thinking, oh, it's all about the plaque.

Yeah. It's not, you know, and you did have perfectly clean pipes and your LPL, your LP little ways up and you get to have a coronary event. You're still at risk.

And now history of diabetes, family history of diabetes certainly influences that one. So but a lot of times people don't get those. They just get like LDL, HDL, total cholesterol and triglycerides.

Oh yeah. Everybody. Yeah. Yeah. Everybody should get an advanced lipid panel. I don't I don't think it's I don't think it's advanced. I mean writing about it for 25 years.

I mean it's not it's not so advanced. I think people should be doing it and they're not, you know, for sure. Yeah. No, I'm, I'm, I'm I'm with you on that one.

I keep scratching my head wondering when are they going to make it standard of care. Yeah. You know, when is it going to be as important as anything else?

Like because we have the information, like why? Why aren't we using it? Well, it is our number one killer. Still heart disease. And you also use other stuff like HDL is it's interesting if the DLLs are small or you're making a whole bunch of them like over a hundred and, you know, and I actually look for toxic metals in that.

Interesting. Because it's a response to toxic metals, the bodies. That's the thing, right? We don't realize that cholesterol is something that the body is using to try and fix a problem.

I think people have been kind of told, oh, cholesterol is good or bad or whatever it is, but your body actually makes cholesterol for a purpose. It kind of needs it.

Yeah. That's called your every cell membrane in your body. And it's how we make our hormones. So yeah. And interesting toxic metal to study. Yeah. And I'm, I'm by no means here to break the dogma of the lower the dogma, the lower the cholesterol the better.

But there was that huge European study showing that when people had total cholesterol of 220 to. Two. 40. They lived longer, which is higher, right? Yeah.

Yeah, yeah. It wasn't there a study that also showed that elderly people that had the lowest cholesterol had the highest chance of depression and dementia, like it actually completely works against the brain.

Well, I mean, it makes the bottom it's not paying off like we need the cholesterol. Yeah. No, I mean, what we need to do is stop clacking processes without thinking.

You take the cholesterol out, like, how do we stop meta formation and stop the immune system from getting so aggressive and attacking things? Right. Because, you know, heart disease is an inflammatory process, right?

Yeah, yeah. And I think people don't get it, you know. Yeah. And you've been saying it all along. It's the elevated chronically elevated cortisol. It's the leaky gut keeps coming up.

You keep talking about the leaky gut and the LPs like it's these are things that just keep coming back and they feed each other. Yeah, right. It's a beautiful dysfunction.

I mean, look LPs, they've been writing about LPs in the clinical rich literature for at least. I mean, I know I started talking about a 20 plus years ago, at least 20 years.

I mean, the American Diabetes Association even published a paper that showed the higher the lipopolysaccharide in your blood, the more the metabolic syndrome characteristics you took on direct correlation like pre-diabetes, pre hypertensive obesity, mood disorders, hyperlipidemia.

Right. So and but yet nobody is. And lipopolysaccharide is associated with the development of dementia. It crosses the blood brain barrier. It triggers inflammation.

You make the lectern three galectin three accelerates the inflammation.

Advanced Lipids, Inflammation, and GLP-1s

And now your neurons are crippled very quick. Right. And but but we we don't even tell people what diabetes to take a probiotic much less fiber prebiotic.

How do you really correct your microbiome and get diversity. They just are given more meds. And it's one of the problems with all these people out there shooting up GLP ones.

And that's the only thing you're doing to fix their glucose dysregulation, as they're not appreciating that their gut is broken down by the time they're there.

Yeah. And their access is probably broken down. And they have sleeping issues. And so they go off the med and everything comes right back. Yeah. You know, the way I like to talk about GLP ones is it's an opportunity.

Because when you're on the one you've slowed down the train of damage. So this is your invitation to do the work in a world where not actively breaking down.

And if you do that work and you reeducate your palate and you build better habits and you adopt better, you know, because you've gotten rid of the food noise.

So maybe now you can make better choices. And like, if you can do all those things and get in, and it comes down to what you said earlier, and millions of people, like so many of us, say nothing's going to replace doing the work right.

But if you can turn the work into the way that you live and your lifestyle, and you can reframe it as the way that you take care of yourself, those GLP ones are the silver bullet.

They really are. Like, it's the golden ticket to longevity. I call it a lifeline. I mean, it's it's a lifeline. It really is. Because and what we've done, you know, I mean, obviously I've taught the the GLP one certification program and, you know, spearheaded data they form for the last five years where we really dive into how do you do all those things, diet, exercise.

And then in the Meira centers at lifetime, we're we're showing people losing weight and not losing lean mass because because first of all, GLP ones do not cause lean mass loss.

I mean, thank you. Multiple studies showing that they actually help you gain lean mass if you eat enough protein while you're on them. But it's it's the fact of exercise, getting their lifestyle straightened out, helping them with a diet, holding them to accountability and then moving them through, doing all the things that you just said.

And then they come out the other side not needing the drug because you titrated that drug, that GLP one, only to the amount you needed to lose 2 to 3 pounds a week and then you can trade off, you've learned your new lifestyle and it and it works.

And look, I've come a family of obese type two diabetics. I have every bad gene snip every. I'm serious. It's crazy. And I know, like for me to keep myself, I mean, I wouldn't be too good if I was getting up on stage at A for em and didn't look good for a senior citizen, right?

Right. I gotta you gotta look the part, right? I gotta work, you gotta work, I gotta like, yeah, I'd like to eat more. Yeah, I wouldn't mind exercising a little less, but I actually like doing both.

I like exercise, I adopted, you know, living in a family that had a world famous chef. I already love good food, but I just had to learn what was the right good food.

I just think that until we get back to understanding, it's work, but it's worth it. Yeah, yeah, it's it's the it's the work of of living the great life.

It's I think it's a free frame and, and getting the life that you, that you want. Okay. I don't want to run out of time. I want to jump to the peptides because I think we need to have a conversation about that. We've been talking for a while.

I'm jacking. I'm just jumping to my peptide section because I want us to dive into that. You're too much of a gold mine for this. It's the good news is we did the mod, see? But let's start.

Let's back up a little bit and talk about the biggest misconception you see in peptide right now the expectations, the sourcing, the safety or using them instead of fixing the like, you know, let's you get I'm giving you like a two minute rant.

Like what is making you crazy right now in this peptide conversation that's out there, everything you just said. Oh, wow. No, I mean, look here, here, here, here.

First of all, it they can be magic bullets, but for the metabolic ones, there are no magic bullets like BPC. If you have an injury, yeah, it's going to help your injury heal no matter what.

But the better metabolic shape you're in, the less chronic inflammation you're in, the even then, the better the BPC works. Yeah, right. If there's a biomechanical issue, like I tell people, look, if you've got if you've got a like, you've got something going on in the joint.

And now this is really irritated because of misplacement. If you don't correct that imbalance, the BBC is going to help you. But then it's like a GLP one.

It's going to help you while you're using it. And then when you stop, yeah, you're going to tour all over this. You're back. Yeah. It's that whole thing. It's interesting.

Remember I was at the NBA summit a few years ago talking, and I, and I quote the this thought of you can never separate biomechanics from biochemistry.

Right. If you're creating pain because of structural issues, those signals are the same as if you created them biochemically. Right. But so anyway, the first one is the big misconception thinking of them as magic bullets.

When I started teaching at Peptide Society, I was big on understand what nutrients you need to make that peptide

work better. Thank you. Yeah. Because nobody we all forget that peptides aren't essential, right?

We make them in our body. But like the external use of a peptide is not essential. Magnesium is essential. You know B6 is essential, right? We do. You have nutrients on board that are going to help you.

And it could be any more collagen or any number of things. Right. It could be any number of things depending on what you're doing. But the bottom line is the more you can think globally, the better.

And nobody does that. The other thing is, is the stacking of peptides. Young people that are using peptides, too many, too strong a dose, getting them from research houses which don't have to they don't need to spend $100,000 in validation in order to prove they made a safe batch of products.

So when you made something for human use, you you have all this testing you have to do to validate that your method is there. And then, you know, there's.

And then every time you do that method, you have to retest the product. And that's another 2025 grand. When you when you're a research peptide, you don't have that same mandatory rigor.

Yeah. So some of you don't. Yeah for sure. Exactly. And so that to me creates a big a a big problem. Secondly there dangerous drugs. People shouldn't be buying injectable products out on the internet and injecting them in their body without any oversight.

I mean, people don't realize once you inject something in your body, it induces a level of what's called immunogenicity, meaning that if that peptides not clean, if it has too much LPs in it and no toxin in it because and no thoughts and ends up there, you got to filter it out.

Your immune system is going to go haywire when you inject that. And it's potentially life threatening. Yeah. And then it's what how much are they doing?

And then it's, you know, how many how often there's so many variables. And it's a lot of people. I got to be honest, I never realized so many people were into peptide research because they're all over social media.

There are these people. They must have been their whole lives. They were researching on peptides and now they're talking about them. And but it's not that it's like the it's like the and look I get it.

But it's like the but I also don't get it because injecting things is different than taking a pill. Right. Like the topical Pep. They're like peptides are topical oral bio regulators.

I have less, you know, a little bit less of a threshold on that. But the problem is injections, research grade people, you know, pulling it up, having a picture of it on Facebook saying, is this the right amount?

I realize if it's a top one, you could be creating pancreatitis. Life threatening things can occur. This is not so there. That's my two minute rant. Yeah, I can't help it.

I could go on another ten but I won't. No, no, let's let's stop because we're going to give people some more stuff. But I think that, you know, to put it into context for people, if you're not, if you're thinking of getting into this world of, of of these really powerful signaling molecules.

I just want you to think that if you can take micrograms of a compound, float it in a 10th of a milliliter of liquid and introduce it into the fat in your belly, and instantly, like with oxytocin, within a minute you're going to get a head rush, you're going to get hot.

You're going to feel like, think about how powerful these signaling molecules are in your body, which is their beauty and the reason why to be respected.

Right. And that's right. You know, they're being right now. What what I'm afraid of, what I fear right now is they're being diminished, like brought down to a cool, fun, almost like a party trick.

And we need to pull back a little bit. Right. We need to. And I'm hoping the balance is going to come before something bad happens or somebody gets hurt.

And I mean, look, BPC 157 I don't think we'll ever really kill anybody. But at the end of the day, you know, it's it's it's a little bit what we talked about earlier is what demands are you putting on your system and are you feeding.

Are you supporting the demands with what it needs so that you don't overtax something by accident? And maybe let's talk a little bit about you talked about an allergic reaction when I, you know, you can have an allergic reaction to a peptide even if it's clean.

And I think the big players there are CJC 1295 like the growth hormone secreted by CJ 1295, even thymus and beta four I have found quite can be a little more prone to driving reactions in people.

And I'd love you to address that a little bit, because there's this underlying thing that says, oh, these are naturally occurring in the body. You can't be allergic to them. They're fine. Yeah.

And the thing is, is even if they're naturally occurring in the body, once you put them in an injectable form and you put them in a needle and you shoot a menu, that's not it's a different process of getting it in your body.

Now your body looks at it potentially as something foreign. And so, you know, that's why, you know, if you get a rash from something, it's kind of funny.

When you're a pharmacist, you know, you have to learn these practical things. Well, you got a rash from doing that. Stop doing that. Yeah, it's real simple.

You know, that's my clinical pharmacy background, right? It hurts when you go like that. Oh, don't go like that. And then we'll fix why it hurts when you go like that.

Right. But but I think that's the biggest issue is people ignore those signs. And that's a problem. And it is a legitimate thing on the Cogs, especially if I'm on CJC.

If you notice yourself getting a wheel or a hive, you have to stop because the next time it could be your airway closes. I mean, it's that simple. And so I think that's where that lack of respect and I do agree with you, it's people think they're like their dietary supplements.

It's like the next level of a dietary supplement. These are powerful drugs. They're just they're drugs that offer a bigger upside and a lot less downside.

And that's why a lot of peptides are now in healthcare. And that's why insulin, the first peptide in healthcare, has created so much value. They because our body have recognizes them.

There's less of like a foreign material just blocking something occurring. Right. Yeah. So that part is you know, really what I think people need to understand.

And, you know, and like in general, I have to be honest, I haven't seen a lot of people like when we testified before FDA gushed about a year ago. At this point, I collected over a million scripts from nine pharmacies without a significant adverse event, meaning, you know, somebody hospitalized got their die.

Not a single one. Did they have a side effect? Yeah. Well, you know, you're drinking water. You can have a side effect. Yeah. You know, each of many potato chips.

I mean, it's always possible that you get that. But there wasn't there wasn't any big adverse events that were

reported. And that's what I think the beauty of peptides are.

But I do think in general it once, not just once they're injected. You got to do it under supervision. Like somebody needs to know what they're doing, telling you how to do them.

So there's watching to see is this accomplishing our goal when you're taking this. Yeah. Is this going in the right direction. Yeah. Is it the right thing right now for you?

100%. VPC miss, there were a couple we talked about before we started recording that. I just I'd like to blow them up right here, right now, please. And thank you. Cool.

Because I'm tired of hearing people talking about them, and I'm not a pharmacist, so you've got more gravitas than me, so they'll listen to you. So the first one, and as I think it's a nuance that somehow people have misinterpreted in the literature.

BPC 157 one of the things, one of the many beautiful actions that it performs in the body. I've always learned, is that it upregulates the expression of growth hormone receptors, which is part of how it helps with healing to soft tissue.

Peptide Safety, Misconceptions, and BPC-157

Maybe somewhere along the line, somebody skipped a few words in the sentence and decided that BPC 157 increases the release of growth hormone. Can we please just put that baby down to rest by at a beautiful bouquet of flowers and by forever?

I think that's why they aren't using it in any professional sports is because of that statement right there. Because if it if it increases growth hormone release, that's going to ban it.

But if the receptors are just functioning better, meaning that my body is just accepting what I'm naturally releasing better, what's the problem. Right.

And so yes, it upregulates growth hormone receptors, but it's not a secreted Gog like Surma. Ellen Ellen CJC 1295 formerly Tessa Maryland. Right. Yeah.

So all of those you know yeah they caused that but not VPC. And it's such a shame you know, because particularly in professional sports where BPC has neuroprotective effects, it can help Heelys.

It like it's so beneficial for those guys. It helps with healing the gut which you know, an extreme athlete is going to have a leaky gut just because of all the stress that they're under.

It's you know, I don't know, I hope that someday somebody comes to their senses and allows it because it makes me sad. These guys and some of them get suspended because they they get suspended for using it.

You I mean, I've seen people heal. I mean, my sons Liz Frank injury I mean a big foot injury and he healed and like 40% of the normal time. Oh yeah I mean it was amazing.

And and they he and you heal better. Like, the tissues heal better and they protect you if you're getting cortisone shots so that your college and and connective tissue doesn't dry out.

There's so many benefits to it. It would help so many athletes. And you know I, I wish that that one was different. But you know, I have people call me all the time and ask, hey, can I use, you know, say work with, you know, a lot of forces and professional teams and like, no, can't do it.

And I'm telling you, you can't do it. I'm not telling you wink, wink, you can do it. But no, no, no, don't. I'm really telling you don't because they will pick it up on you people they went that they cannot test for.

Well how do they look for. They left like tablets. So I don't think the other population that benefits a lot from BPC. I mean everybody does in, in the right at the right time is the is our elderly population.

Oh, without a doubt. Like my mom and dad, I have on occasion helped them through some stuff. And and they're medical people kind of scratch their hats and wonder how did that happen?

Right. But it works like, I mean, you know, I mean, the beauty is, is I think in health care now, there is at least that thought of, we don't know what you're doing, but you're better.

So keep doing it right. That kind of thing. I like that instead of kind of that strict scolding that used to be the case of, you know, there's no evidence.

I mean, we, you know, we've written an international peptide society. It kind of spirited my staff and I 100 monographs with all the full text studies on peptides.

Wow. And rated by the level of evidence thousands of pages we've done. So the evidence is out there. The other thing on BPC that everybody talks about is all it can induce cancer.

It's going to increase cancer formation. Number two, it doesn't it does not. It's called a it's selective angiogenesis meaning it's selective in the way it promotes blood vascular.

Pretty like it's going to help get blood flow to your muscles and tissues. But it doesn't feed organ. It doesn't feel like a tumor. So and there's papers on it.

It's over and over again. But there's this thing of, oh, this peptide causes, you know, can feed or cause cancer. You had mentioned when we were chatting before TB for, you know, TB for thymus and beta for, I mean, it's there around the tumor to try to fight the tumor.

Yeah, exactly. But you know, it's I'm shocked at this, at how these words sometimes come out of medical people's mouths like this. Talk about not understanding a pathway. Right.

It's really it's disappointing. And you wonder sometimes or people just trying to get eyeballs because it's the, you know, the literature is very it's pretty clear there is quite a lot of evidence that, yes, that's why you're Achilles.

That gets no blood flow, will actually heals. Exactly. Right. Like this is why it will be to the muscle and connective tissue in the bone. Right. So I know and that's under that injury. Right.

And and yeah. And I think why I've enjoyed teaching it a forum for the last 25 years. And you know and being a co-chair is. I have a lot of docs come there and when the light bulb goes off.

It's like that's the most rewarding thing when I have a practitioner come and they say, hey, you know, you change the way I practice and I love doing medicine again because now they have solutions and people come back and say they feel better.

They're not just managing them with a drug. It's like hey. And once again we have two health care systems. How do we keep people? Well, and once you're not well, we got to manage it.

Still, we still got to love you. Yeah. We can't, you know, it's like this. It's this yo sick care system. Horrible. Know when people are sick. I know my family, my brother, my father.

Both their lives saved by modern medicine. Yeah. Listen. Yeah, right. But the problem is we don't do enough on how to keep people. Well, it's that simple. 100%.

Do you want to talk a little bit about different modes of administration for BPC? Because that's another thing that people incessantly. And I'll tell you a tiny story first and then I'm going to let you roll.

Sure. So I, I decided my mom and dad, you know, they're in their late 80s. It was time for them to do a gut healing thing. And so I have a supplement manufacturer I really like.

I gave them it's a, it's a stack with built with BPC and a bunch of other peptides that are really focused on the gut, so sent it to them. My mother, of course, doesn't listen to everything I say.

So she doubled the dose and after two and a half three weeks, I get a call from her saying, we need more of that stuff. I'm like, yeah, like, hey, which stuff are we talking about?

Because I send this stuff. Spent a lot of stuff. Yeah. Which one, which one and why? And she said, well, you know, those pills that you get. And so she, I figure out it's the BPC stack.

And she said, well, and she had, she had just really injured her shoulder. So she's 87 years old not healing very you know, she's okay. I mean she's great, but she goes, well, my shoulder stopped hurting and your father's back stopped hurting.

Yeah. And and you know, all our Instagram warriors out there saying or VPC doesn't work on anything. Anything is one pan. And then the other camp says it'll never touch a physical like musculoskeletal issue.

So yes, the injectable and maybe transdermal might be better, but I'd love you to speak a little bit to some of the different modes of administration of BPC 157 and yes, it can be used orally.

Yes, it's going to help. It's kind of going to go where it needs to go. Yeah. I mean, yeah, I mean BPC absolutely. People have used it orally and have seen benefit from it.

And you know, there's different ways that you can administer that. You can do it as a capsule. We were involved in developing a liposomal solid state tablet that, you know, that doesn't go through first pass effect.

It absorbs into lymphatics. And so it was a that actual delivery system was worldwide patent pending on all drugs, all nutrients for small molecules and peptides.

And so we started it. Yeah. You can get you can get it. It's pretty cool. But so the point being is then there's yeah, you can use it topically. But people thinking the BBC orally isn't going to help your gut.

It's kind of funny because when you swallow it, it goes through your gut. And BPC actually stimulates the mucosal to produce more mucus and repair. And so you take it that way.

And guess what happens? 70% of your inflammatory response is coming from your gut anyway. So as you calm down the inflammation signaling in the gut, you help global signaling.

And the fact is you're sending those signals. Once again, our body is a system of systems. You're sending those signals to the Myakka, which is the muscle network, to say, hey, I don't hurt so much now.

Right? So yeah, it's totally, you know, people would say, oh, BBC is an oral doesn't work. You know, that's once again, bro bro. And then but then of course, under the supervision of the right person, injectable does tend to be the most effective and efficient, especially on a two day injuries.

I mean, honestly, I've seen enough of the light delivery that I think on chronic injury it could catch you up pretty quickly. But on the acute stuff, of course, an injection is the way to go and hopefully we're going to get that back.

There's a lot of rumblings that we're going to get some peptides back. I'm sure hoping that happens so that, you know, it's easier for people to get them.

And if we can get them in compounding pharmacy and that stops research pharmacy, then by default scripts get written and it's under supervision. That'd be my dream.

Yeah. Okay. I'm that's not a bad dream. I'm okay. So another question. What are your red flags? That someone is using peptides to override recovery signals and dig a deeper hole that happened ever did?

Oh, yeah. Yeah. I mean, I think the red flags to me are they're still sore too long. They're doms. So they get like that. They're delayed on onset. Muscle soreness is off.

Their reaction times are off. Their heart rate isn't you know, is going up. Still two minute heart rate recovery is not good. I look for a lot of those autonomic things like hey, where's your you know, what's your two minute heart rate recovery?

Where's your resting heart rate. What's your heart rate variability like. Right. How saw are you. I mean all those things kind of tell you, especially if people are taking it that they're trying to kind of mask recovery.

Yeah. You know it's still going to it's still going to show because it doesn't necessarily reset the autonomic nervous system. Yeah. No. Are there labs that you would run before.

Do you think people should run or should be run before people use peptides like is there are there any lab markers that I mean, I mean definitely on the metabolic side with the GLP, once the blood sugar, the even inflammation, all of that stuff.

But with any like, do you think IgG4 one is a valid marker before someone's going to throw, even though it's not an exact analog to growth hormone? Do you think that there's any validity to looking at IGF one before somebody uses a growth hormone security dog?

Because I get that question a lot, right? Especially from people with teenagers. I'm like, they don't need growth like they're making it, but do you see that?

And and even in an older person, their idea of one might be great. Yeah, right. I don't you know, the problem is, is I found it such a friable number I you're offline our and it can be really different you know.

So I think like the and a lot of times we don't realize research labs can be different than what's available commercially. So for example lipopolysaccharide there's no serum available commercially if you only get an antibody test for it.

And that's not the same thing as what all the literature said. So they're different assets. Yeah. Yeah. So I'm not as big like I let's put it this way.

Once somebody's got their insulin resistant and their iPhones going high because they're getting their pre cancer, I start getting worried about that.

So I'll measure them. And people that are insulin resistant and want to add secreted gods. It's like well let's see where your IGF one is at right now.

You're already through the roof because we know that that goes up when you start creating the Warburg effect or more cellular kind of aerobic glycolysis, cancer behavior chemistry.

But I mean other than that I don't worry about it as much. I'll look at things like, you know, if we're looking at, you know, using, you know, peptides for healing, metalloproteinase nine, metalloproteinase three, looking at metallic protein ACS, which are the connective tissues, inflammatory markers.

You know, I'll look at those if I'm using something like thymus and alpha one. You know we teach that you know you can look at neutrophil lymphocyte ratios.

You can, you know, kind of start to characterize what are we looking for. What are we looking for. Their well, you know, your neutral site ratio is like how hard are you being pushed.

Right. So if you're a neutrophils are real high. You're in a chronic state of inflammation. The trail low. It means you've lost your resiliency to respond.

And so you know you kind of want to be in the middle. And and just like that DHEA ratio right. And then you know you could certainly look at white blood cell counts and see where they're at.

You could look at if you want to get really elegant cytokine panels, advanced cytokine panels. But most people just honestly I don't do a lot of it anymore.

I mean, I look at regular labs and then if I need to check metals or check for bio toxins, maybe things that are environmental burden to the body I check for.

But a lot of times, I mean, I'll do a galectin three because it it's highly correlated to increasing diabetes and dementia risk. You know, look at things like a depicting because it correlates mitochondrial output.

But, you know, I think for a lot of people, you know, the first step is, is, well, what am I using this peptide for? Oh, I'm healing an inflammation. Well, let's look at inflammatory markers in your body.

Where's your CRP at. Where you know, where is your nine out. You know, where is your call to at. You know like you can get markers for inflammation in tissue let's say non immune.

Like it's not an A and A or rheumatoid factor or a C3 A or C4 a, I hurt myself. It's not been getting better. What could I measure. Right. And so I think you do that.

And then metabolically look the scale works good if you're trying to lean yourself out measure you know, get a body comp. Are you are you improving lean mass I want to take you know, I want to take screening guys improve my lean mass okay.

Is it working? Did you measure it? Measure measure it. You know the measure. So because here's the thing. People spend a lot of money on these things.

Yeah. Like, you know, I mean, I it's like I don't you want to know if it's working? Yeah. No, for sure. It's a lot of money. So I want to spend a minute on the liposomal chewable peptide angle a little bit. I want to talk about that a little bit.

You've mentioned it a couple of times. And then we're just going to go into we're going to finish up. So you you. So Metabolic elite has a patented oral liposomal tablet.

Do you want to talk to people a little bit about why is it different.

Oral Liposomal Peptides and Delivery Innovation

How is it bypassing. Is it is it a Google tablet that basically so it's chewable. So it is you are swallowing it and yet. So fill us in. Yeah. Yeah. So it was funny I first found it this technology because I was looking for a way to deliver Gen R3 because I had developed it as a nasal spray known as synapse.

And and you know, which is great for decreasing microglial activation, but you couldn't take it orally. There's just you had to take too much of it. And this stuff was super expensive.

So I found this pharmaceutical scientist that had developed this. He had patents on it. And what it does is it he patented it for all compounds because it delivered difficult to difficult to deliver compounds.

Either class for compound scenes didn't absorb or taking small molecules and be able to get them into the micelles in the limb and not go into first pass effect.

And that's what you know what? So it's a multi-layered and I did not develop it. I'm just saying the scientist developed it. I looked at application and I looked at it and went, wow, that could be really interesting.

So I developed it and with them added that synapse. And as the very first thing we did, because it's a small molecule, difficult to absorb. People loved it. Their cognition was better.

They just like that, almost like the nasal spray. Nasal spray. Once again you hit your head. You've got, you know, you know, your early dementia. You probably want to use the is great.

Otherwise, the tablet ended up working just as well. And we just did our first person in a trial where we we did it and we saw 40% improvement in cognitive processing and wow two doses.

Yeah. So it's pretty cool. So you're kidding. Then we started playing with it and adding things like semaglutide with the compounding pharmacy using Surma Ellen.

We did testosterone where we could do physiologic doses like five milligrams tabs of testosterone as a life is all tablet and and you chew it and you're just matching the circadian rhythms.

So you chew it in the morning and you chew a smaller dose in the afternoon, and you're matching your natural circadian rhythm, and it clears out at night.

That's one of my big believer in biomedical hormones. But there are people that are sensitive to just like having, you know, nonstop signaling because of that hormone being deposited via injection.

And once again, there's room for all these types of delivery systems. Pellets work because people want convenience. I like this because there's people that don't tolerate pellet.

Sometimes they get acne from that kind of stuff. And we you can do this. And our first person that we actually started doing every half hour but draws 1100, 700, 500, 400, 700 because we gave a smaller dose second one.

And so we're following these folks now. And it's turning out there. Their liver enzymes don't go up. They don't build more iron. They're you know, they're hemoglobin doesn't go crazy because it's because it's following your diurnal pattern.

And that's one of the things of the last ten years is trying to figure out what's why. Apatow an so amazing it resets as a peptide your diurnal pattern.

So we started playing with using this, you know, liposomal technology to deliver peptides. You know you know and and we're finding it enhance their effectiveness.

You know. So it's really an interesting work that he did. They developed it for oncology drugs and for pain meds because you could take less of it and reduce the risk of adverse event.

Yeah. So the last question on this is in the white paper you contrast liquid liposomal versus versus the tablet. And it has to do with stability right.

And particle size. Do you want to just address that a little bit. There's there's liquid liposomes all over the place which I mean we're not going to try them.

But there's if there's a distinction there that's to be made I think. Yeah. Yeah. Yeah. There is I mean so we know the particle size of this liposomal tablet.

We've done electron microscopy and for copy on and against a variety of compounds, it maintains the particle size at under 100 nanometers, which is the particle size you need to get across your cell membrane.

And in many cases they're like 57 nanometers super small. The problem with liquid liposomes and this is nothing against liquid liposomes. But you hear the term liposome and you think everything's it's all one thing and they're not.

Yeah. Liquids tend to agglomerate they. So when you make a life of zone they use these electrical charges to separate stuff separates the particle and it disperses it.

Well, the problem is, is that the laws of attraction, the particles start coming back over time, and then you start building bigger and bigger compounds.

And all of a sudden, after you've made it nine months later, the product is too big to absorb. It's a blob. And yeah, it's a big bob and you can't absorb it.

It's like 3000 nanometers instead of 50. And so, you know, that's the which is the kind of same story is the tennis net, but in a positive way. And this situation, you want small nanometers to absorb things into the cell membrane.

If they're real big, they can't get in. And that's a real yeah. It's been a great innovation. It's continuing to evolve. It's pretty fascinating. We're working on a multi weight lipid that you that you can put a compound in.

Rub it on your skin and it pulls all the way down into your tissue to get into your bloodstream too. So it's pretty. It's been it's part of one of my I guess my big passions is I love technology and software analytics and all that.

But then I love a receptor. Well, circle your full circle okay. Last few quick questions here. But let's make these. We're going to go and fire for the end here.

If you zoom out five years what will be the best. What will the best longevity clinics be doing that today's clinics are not providing more adherence and guidance so that people stay on their program and actually change their behaviors more, instead of just handing them programs and expecting them to do it.

Okay, what's the next meta inflammation blind spot? You think the public will realize too late unless we change the narrative right now? Wow. Honestly, I think there's something to electromagnetic pollution.

You know, I've been watching it for a long time. Actually, my one mentor in Germany was big on it. So I think that you kind of have to watch, you know, and I'm not saying go extreme because we're all getting hit with 5G and whatever.

When we open up, we see all the networks. But you know, having your phone next to your head, you know, always having these kind of things on 24 hours a day, like all that kind of stuff.

I think, you know, you look at how many people just have their phone with them all the time and have other kind of devices with them all the time.

Longevity Clinic Trends and Closing Resources

I know there's an awareness that's floating up in the professional sector. I don't think the public's anywhere near aware on that. Yeah. Got it. All right. One biomarker you think is underrated.

Just one mean platelet volume. One biomarker you think is overhyped. Cholesterol. One daily habit that gives the best ROI for inflammation. Learn that life is about joy I love it.

The most common mistake high performers make with recovery they don't do what they need to recover. Not enough sleep. They don't eat. Not asleep. Yep. The question you wish every patient asked in the first ten minutes, when they sit down in front of their medical professional wish, they asked, are you going to really pay attention to what I'm going to tell you?

Thank you. This has been a great conversation. We've covered a lot of ground. Thank you. Yeah. Let's go. I feel was fine. Thank you so much. I want to do it again.

You have to invite me back. Oh, yeah. No, we're doing a part two 100% that you can count on it. So in the meantime, where can people find you? Where are there any resources you'd like to share with people and all the things?

And yeah, it's a book on peptides. Peptide Handbook, available on Amazon. Written two additions to that. Obviously the metabolic codebook still out there and really good.

And it actually talks about all this stuff. But the new one will be out this year. Handbook on Your Blood Never Lies, a book that how to read a lab test for help.

Yeah, right. That big a lot of people, a lot of providers use that. Actually, I wrote it for consumers and then Jim. Com and then the real Jim Lovell on Instagram has got so many posts where I'm going over stuff, I didn't even know how to do it.

My son's got me out on all that stuff. I mean, I didn't even realize anything about any of that stuff. So he's. Yeah, he's got me out there now. And, you know, fortunately, few people want to listen anyway, so it's good.

Okay. Well, I'm going to ask one more question, one more thing, because people are going to ask for the Life is On tablet of BPC or whatever else that is by prescription, through a compounding pharmacy and a physician.

Or is that something, an OTC product? Yeah, I mean it really right now you can get it through a vaccine, through a physician. I mean, the BBC orals is still kind of in a gray area.

So metabolic Elite is still making it. But as soon as we get clear guidance, they may not be making it anymore. That's a company my son runs. I mean, it's just it isn't.

Nobody's doing anything about the capsules. I mean, so I just I don't know what's going to happen from that. But you get you can get it there for now.

Yeah. For metabolic elite. Com. Right. Amazing. Thank you. Yep. All right. Sorry. Thank you so much. It's been great. And I can't wait for part two. Yeah. Let's do it.