Introduction and guest background

Hello and welcome to another episode of the Telomere Summit. I'm your host, Doctor Joseph Rafael. I'm very pleased to have today, doctor Matthew Cook, to talk about all things regenerative medicine, peptides, mycotoxins, and wherever else the conversation goes into telomere biology in particular.

Doctor cook is president and founder of Bio Reset, medical and medical advisor of the Bio Reset Network. He is a board certified anesthesiologist with over 20 years of experience in practicing medicine, focusing the last 14 years on functional and regenerative medicine.

He graduated from the University of Washington School of Medicine and completed his residency in anesthesiology at the University of California, San Francisco and has completed a fellowship in functional medicine.

Doctor Cook's early career as an anesthesiologist and medical director of an outpatient surgery center specializing in sports medicine and orthopedic procedures, provided invaluable training in the skills that are needed to become a leader in the emerging field of regenerative medicine.

His practice, Bio Reset Medicine Medical, provides treatments for conditions ranging from pain and complex illness to anti-aging and wellness. He treats some of the most challenging to diagnose and difficult to live with elements that people suffer from today, including Lyme disease, chronic pain, PTSD, and mycotoxins.

Illness. Doctor Cook's approach is to use the most noninvasive, natural, and integrative ways possible. Welcome again, Matt, to the Telomere Summit. And, let's dig in on all the things that you have to talk about.

In your practice. I know we are in similar fields, but I have much less understanding and experience in the peptide field. And you've done work in telomere biology.

So, why did you start to tell us just a little bit about the journey you had from anesthesiology, into this type of medicine? Now? Oh, that's a good one. I, I went into anesthesiology.

It's an amazing sort of opportunity to take a deep dive into biochemistry and and physiology. And at the time, I was really into expedition climbing and, rock climbing.

And so I thought I was going to be a team doctor for going to Everest. And, I thought, I need everybody told me you need to have a job where you can take six months off.

And if you become a, internal medicine doctor, which I kind of would. I wish I had all of your knowledge, but they said if you do that, all of your patients are going to leave by the time you get back from the Himalayas is no question.

You don't get to get away from your patients in internal medicine, that's for sure. So. So then I went and did a seizure. But then I kept kind of having this cognitive dissonance that surgery is they say surgery is a chance, a chance to catch, a chance to cure, but it's also a chance to cry.

And so I started to feel that, there were probably better, less interventional ways to help people with problems. And as I was sort of doing this, the thing that I evolved into spending most of my life doing in anesthesia was doing ultrasound guided nerve blocks, so that I would put the nerves to the shoulder or the hand or the foot asleep.

And then I would do, the basically orthopedic surgery with sedation. And then about eight years ago, we started to find out that if you used something other than numbing medicine, a lot of times we could, improve pain.

So that included everything from, dextrose to exosomes to stem cells to placental matrix to peptides that actually, and so then I started treating a lot of peripheral nerve pain.

And as I got into an interventional pain practice that was integrative, we ended up picking up a lot of people with complex illness because there's so much pain in that population.

And because I was doing nerve hydro dissection with peptides, then I started to deal with a lot of neuropathic pain. And so, and the whole time I was doing that, I was realizing, oh, now if you start taking care of these fairly significant problems, I got gotta I've got to go back to the beginning and become an internal medicine doctor like you and then try to to try to do that.

And so then I went back and did, a fellowship in integrative medicine. And so ever since then, I've been trying to put, put those the interventional and the integrative and sort of the functional medicine worlds together.

From anesthesiology to regenerative medicine

You know, that is a really fascinating journey. You finally came back to what your real passion was. You know, we'll get back to whether you actually got to do some climbing and, at some point, but, but yeah.

So you're, you know, just blocking the nerve is one thing. But then of ultimately trying to figure out what's the inflammatory processes, what's the physiology behind it?

Is it it sounds like that's what's fascinating to you and brought you to this field of peptides. And treating chronic pain and chronic illnesses. I know we talked a little bit earlier about perhaps doing a little bit of a primer on peptide therapy and how you use it in your practice, and then moving towards potentially how, you integrate to 65 and some other, and telomere biology in general into your, into your practice.

Okay. Yeah, that's a good one. The so then I'll, I'll take you on a little little story about the history of, of how peptides have been used. And, and this goes back to, a famous Russian doctor, Dickens.

Levinson. And, he really did groundbreaking work. And he used both a combination of injectable peptides, which are synthetic versions of, peptides that are identical to what are in our body.

But then he also had extracts of, basically glandular. So an extract of the pineal gland, and then they would isolate that extract and, concentrated it in the actual peptides that were in that organ.

And then what they found is, is that there are small two to 4 to 5 amino acid peptides that, regulate every organ. So there's a couple for the brain, there's one for blood vessels, there's one for the heart.

So and, and the idea was this that people would take these bio regulator peptides, and they used that as an anti-aging strategy. And and one of their and so they this was this goes way back to, you know, 20 or 30 years ago.

And so they started to measure telomere length, and they were using the pineal gland extract. And so that's the and so that would be like the the name would be epithelial.

And then and so then they were using these, these, these extracts and, and so there's a whole bunch of different protocols. But like one common protocol was to combine the, the pineal gland extracts with thymic extracts.

And the thymic extracts are immune. And there they had evidence that as we age, the amount of, the, the and I think this might be hypothetical, but maybe not the, our thymic, proteins and our thymic levels go down and, and we kind of know that just intuitively because the thymus tends to involve it as we age.

It's oh, no, they certainly do. Yeah, I think they do. And then, you know, T Rex go down and all sorts of indications of thymic activity declines, with age.

And by age 50 there's not all that much going on there. Which is when we start to have problems. Right. Interesting. Yeah. I'm getting in here because I just turned 50.

You go, so then, so then that, was a protocol. And so then they have all kinds of research of, and, and I've got the reprints of, of these in English of protocols where sometimes we people are on protocols where they're just taking a couple, like the pineal extracts and the, the thymic ones.

But then there are other protocols where people are taking, host about basically a bio regulator for almost every organ. And so then they correlated, that people tended to have less cancer, less, aging and tend tended to have, and, and in their trials they found a, a reduction in all cause mortality.

Well, and and so then this, this research fundamentally we need to read kind of continue along that line and then and reproduce that here. And so there's going to be work to be done.

And then the, the testing that was it was amazing that they were able to do that. And they were able to prove telomere length thing all the way back in that time.

And I was telling you in the pre call that we had what we really want to do is probably repeat this with some of the new diagnostics that I think you're probably the smartest person I've met up until now in terms of knowing about that stuff.

So so anyways, the, the 1.0 was this whole Russian literature. And so then what happened is, is all of a sudden, they figured out, oh, okay, well, we know what the amino acid, sequence is for epitaph on.

So then let's give that. And initially what they did is those dosing algorithms were based upon the, the concentrations that were given from the glandular as from Cavan. So, okay.

And so and so then people were taking ten milligrams a day for ten days. And so then that that dosing ended up. And so then people were doing that twice a year.

And so then it's going to have an epigenetic effect. It's going to go into the DNA and and then affect you know, the transcriptome. And so as a result of that people the there was this idea okay we'll do that a couple times a year.

And then that's going to be part of our anti-aging strategy. And so I did that. And a lot of people did that over the last, I would say year and a half, there's been an evolution where people realize, oh, okay, what cavitation was giving was actually a full glandular with more stuff in it than just capital, and probably less capital and less Apatow on.

Yeah, exactly. And so then there was, there was some evidence that, the, the amount of capital in and there may have been significantly less like 100 micrograms.

And so then what people started doing is they started doing low dose capital on in the ballpark of like one milligram a day, and then doing that for ten days a month and then doing that, doing a ten day a month, sort of bio regulator stack.

So then doing that and then doing that either once a month or a certain number of times per year. And so then there are some people that would do a bio regulator stack for, one week, a quarter, every other month or even every month as, as a ten day protocol.

Peptide therapy and bio-regulator history

And then when people do those, those stacks that typically, they're using some combination of a number of bio regulators, just not not not only the, the pineal gland extract.

So, so that's, that's really interesting. I've had a couple of other guests on that have had, scientific research done in

other countries and languages, in journals that haven't been translated into English.

And, and finally get, you know, see the light of day in English through somebody discovering them. And, and then that that, information starts to explode.

I'm just curious about maybe for our listeners and for me as well, the term best dig a little bit deeper in the term bio regulator, because that's, what do we mean by that, exactly.

For each organ and what, what's sort of the physiology or around that, what's known about the physiology around that, I guess. So the so then there's the not an enormous amount of data here in the West.

Those bio regulators, the, the idea is, is that the EPA talent is a bio regulator of the pineal gland. Okay. So there's like a and there's a one called, quote, a germ that's about a regulator for the brain.

There's one called vestige. That's a better regulator for blood vessels. And so then these are small peptides that are found in those areas. This seem to have a regulating influence upon that organ.

So there's some for the liver and some for the prostate, one for the bladder. And so and so then the idea is, is that these are and so then you could imagine that there would be a host of things that could then regulate what's happening in an organ, including including small peptides that are going to have epigenetic influences upon that organ, including hormones, including vitamins and minerals.

And so then there are just going to be one, one small but, you know, potentially interesting influence that's going to be impacting an organ. Right? So it could be endocrine.

It sounds like it's almost like endocrine signaling LH signaling, the testicles. But maybe it works in different receptors someplace within those, those organs that aren't necessarily, you know, working in an endocrine fashion, whereas direct changes in gene transcription.

I'm not sure, but, in any case, with epi talen, though, the what sort of just a sort of clinical benefits are seen with it. And, and how do you know is it so the big question is, how do you know if it's working, I guess kind of thing.

So so then the what when we have seen clinically pineal gland think, melatonin and think circadian rhythms. Right. We've seen people definitely will say, oh, I'm sleeping better when I take up a towel on.

And then we've, we've seen a lot of people who said, oh, an interestingly, they tend to do better if they take in the morning than if they take it at night.

And so it may be that it's regulating and enhancing and turning back that circadian rhythm into kind of a functional state. Then you say, is that truly and actually, turning on telomerase and, lengthening telomeres and so then I think that I'm going to be probably with you.

What I want to do is, take a, real serious approach to, like using one of the, the newer laboratories that are, you know, using fish to kind of assess the length of telomeres and then take some people and some specific populations and then do before and after testing where you run people through dosing and potentially what I think you're going to need to do is you're going to have to run people through low dosing and high dosing and then compare that.

And so then a low dosing would be like a milligram a day. High dosing would be like, you know, ten milligrams a day, but just for a short period of time.

And then and then compare that and then and start to suss that out because there's been a lot of conversation about it. But I don't think I think we need to we need to really build some great data on this.

Yeah. I think that, I mean, the issue would be in some ways, you're if you're improving sleep, you're encouraging

improving circadian rhythm. You know, you may have a beneficial effect on telomere length, not necessarily to increase it, but certainly to keep it from getting shorter, through just that, whether telomerase is being activated or not.

I guess I mean, the way in which something like 65 is shown to be some of these activators is in the Trap assay in vitro, where you just put it in at Micromolar one Micromolar ten micromolar concentrations and see if telomerase is actually turned on.

And that could be even a first step. I mean, there's places that do trap assays. Perhaps Bill Andrews would even be interested in testing. I don't know whether they've tested AP talent or not.

Perhaps they have, and maybe it doesn't work that way. Maybe it works in some other way to turn on telomerase. Not directly. But, that's one way that you could test it before you even embarked upon a clinical trial looking at the telomere length to to know whether it's going to be direct or indirect.

That's just a thought I had about it. I've, I've heard that he's skeptical of it. Okay. Which is it? Which is why, we've we've had a lot of people tell us they feel really good taking it.

But I'm, I'm, I'm somewhat skeptical also, in part because of some of the, some of the stuff that I've heard, on that and, and what, how much of an effect it has on telomeres.

But then I think the TLR conversations also like for example, 65 is going to, activate telomerase, but it may also have some benefit of decreasing senescence.

And yeah, I mean, I mean, there are definitely, potentially off target effects of, of any molecule, any drug, you know, anything that you're putting into the body.

If we have not for sure proven that it's through telomerase activation, that that reduction in senescent cells that, you know, our listeners have heard about and other, other episodes, occurs, and, and likewise, it may be that AP talent has an effect, through another mechanism, but that would be an interesting thing to do.

I know if you talk to Ed Lee about, his study that he did, which one? I think I, I know him, I like him. He did one, with AP talen, but, he looked at, at, DNA methylation rather than telomere length.

As far as I recall. I mean, I'm not sure if he sent it off. Certainly didn't tell me whether or not the length was. And they're still analyzing data, as far as I know.

But he used AP talent in a, in a subset of patients for, for a while. Yeah. So, so, you know, it could be having beneficial effects through multiple different ways.

The people that say they sleep better, do they sleep better for months after taking that low dose, or that, you know, or is it while they're taking the upper in, it's.

So then that's that one. That's an interesting one too. So if you look at if you hear the the cabinets in research, they will say that there were people who were put on a protocol for like two years.

And then they stopped the protocol. And then they continue to get benefit for like ten years, which was which is, I mean, kind of amazing. But then, you know, it's kind of you'd like to see that repeated, the, the, I would say I would, I would say that I see benefit on sleep more real time.

And so that's like, like when I take it I feel a lot better. And so then that has led to that emergence of people more taking these lower dosing. And so then I, you know, there's a part of me that wonders, okay, well, people were and this is and I thought I would just kind of tell you this story because this is sort of where all of this came from.

And it's a little bit soft from kind of a science perspective, but it's also gives you an understanding of, of it, this one

corner of kind of the peptide conversation, how it started and where it's going.

But you start with ten milligrams and then all of a sudden you realize, oh, people are getting almost the same benefit, whether they take 10mg or 1mg.

And so then maybe they can take 500 micrograms and they can take that. I will tell people, I will say that when we have people who are like real stressed, they will, or going through an illness that they'll also say, oh, if I take taking that seems to boost, boost how they feel.

And it's almost like a it, it has a stress reduction, and an emotional support. And I imagine that that could happen through supporting those areas of the brain.

Is there any I guess the graviton didn't do it, but is there any reason not to take it every day? Well, so then the interesting thing is, is that the so the the my understanding of it is, is that the.

So then, so then I understand a you have injectable peptides that and so then and there's this experience in the west of like let's say high dosing and low dosing.

But then what they're doing over there is they have like organically grown cows that are then, from those cows, they're taking their organ or gland, isolating that and then concentrating almost like a glandular.

Then, you know, you know that has been done forever in Chinese medicine. And so then these glandular. So now it makes sense. If you eat protein you're just going to digest that.

And then that's why most peptides if you take most peptides you take a 50 amino acid peptide. It's going to be hard for that to have a lot of effect orally because your gastric juices are just going to digest that.

However, what's happening on the on the peptide fret is the bio regulators. The by regulator friend is that those are all small 234 amino acids. And so then you can absorb those.

And so then those protocols will have people taking that, that bio regulator every day. And so people will take a pioneer, by a regulator every day. So I've been I, I to be honest, I'm actually doing it right now as a test.

So I feel pretty great, but I, I'm, I'm generally doing a lot of stuff, so I always feel great. So I being in the biz, that's what happens. Yeah. So let me see.

So that's well, you had a division between oral and injectable that, talent is, you know, injectable. What's the relationship between NEP talent and melatonin?

I mean, is there some idea that it helps the melatonin secretion, or do you give melatonin along with it or you don't have to or. I mean, there's there certainly are assays that you can do, with the saliva testing that's available to see whether melatonin, or saliva, urine metabolites as well, whether you're increasing that is any work been done in that area.

I don't think I don't if it has I don't know. You know, I if so, if EPA talent's a bio regulator of the pineal gland, then hypothetically it would have a benefit on melatonin.

You we we see a lot of people who will take, you know, melatonin and enjoy it and, and a diversity of doses. So you know traditionally people are using real low dose.

And, and now there's people doing all kinds of stuff out there. I for people who take melatonin, I would say we're in the low to moderate range and dosing.

And and then for people who do that, some people will do that as a regular, thing.

Epi-talen, melatonin, and telomere questions

Some people, you know, I know it can be fairly helpful in, in big periods of physiological stress and illness. And it's a central nervous system antioxidant.

So, you know, if, if, if I have patients with neurological Lyme or mold, I think it's a great adjunct. And then how I think about either oral, you know, pineal gland extracts or how I would think about an an injectable I Patel on is a support to that system.

But the the science and data on that needs to, needs to evolve. Yeah. And hopefully you know it will with some of these things. And looking at the telomere length, in, in those studies and see what at least study, produces in the end.

Other peptides that you work with regularly that have, beneficial effects. I, you talked about some of the immune modulating ones. So that the immune modulating peptides are going to be pretty interesting.

Those are the two most famous, immune peptides, one thymus and alpha one and thymus and beta four. And we have quite a bit of experience using those, as support for people with kind of complex immune problems.

Think Lyme, old, long Covid, Epstein-Barr, CMV and all of those conditions have the hallmark of B of of a dysregulated immune system. Something comes in and wreaks havoc.

It may or may not be there anymore. It may have come and gone, but then it, continues to wreak havoc and and one way or another, and then each one of those, if you want, I can kind of go through and talk you through my thoughts of what's what's happening there.

Yeah. I, I'm particularly curious about those two. You know, I understand what is it? Thomason one Alpha is, for alpha, one is the alpha 1 or 1 alpha always good?

Alpha one alpha one that that's going to be less available, at this point. Yeah. So then that's what. Well, they're both fundamentally, they're they're both not available in the United States anymore.

It's rich. And, you know, you wonder, is that just because, you know, a lot of people were marketing them for their, their helpful kind of an immune side.

And so then people were marketing for Covid. And so then and there was such a push to get everybody vaccinated, which I'm supportive of. And, despite that, you know, and there are there are people who are, you know, some people are still finding ways to get them.

But then there are the what happens is with these peptides, there can be a fragment, an active fragment of the peptide that can do something. And so then there are, fragments and other versions of these peptides that are sort of coming out.

And so then, right, what what you're going to have is it's a little bit of a cat and mouse game on, on that conversation of, continued, there's, evolution of what we have available.

But then also, you know, the, the audience for this is worldwide. And so that I think that my hope would be that at some point, some of those things come back to United States, because we had a lot of people who who really benefited, from those, so they're generally considered as a supplement.

They're not a drug because they're natural occurring peptides. Or is that or how does that work? I would I think the FDA is going to consider them as, as drugs.

Okay. And so then there's a effort sort of underway, you know, in a variety of different countries to try to get normal regulatory status for, for peptides.

You know, it's going to be it'll be interesting to see what how the evolution of that is. Basically for people who are sort of new to that part of the conversation, the, the most famous peptide you ever heard of is insulin.

So, you know, lot. Right? Exactly. The protein it binds on to, glucose channel and it opens up, opens it up and it allows glucose to go into a cell. And so then there are, and then there are some peptides that have multiple little, signaling, aspects to it.

And so one aspect might help a muscle. Another aspect is anti-inflammatory. And so then and, and so then, what people are finding is this, if you chop that peptide up and just have this, the active version of it, then it's a smaller version.

So it's going to be an evolution of peptides that come out over the next five years, that are smaller versions of other active peptides that we know about.

And you think that's going to be a form of this doing that? Because of or, if it's going to be a drug. I mean, do any of these have USP monographs? Some of them do. Yeah.

Well, one that I use in my practice. Well, let's say, even though it's not available, I'm curious about what response you've seen with, the pharmacies and, and, you know, what do you think the mechanism is?

Is it related to, you know, inflammation? So is it have a synthetic effect or or what? It says that. So, the thymus, an alpha one is primarily immuno regulatory and immunomodulatory, although it will boost, antibody production, it will boost certain cell types.

It'll increase gamma delta T cells. It, and I, I have found it to be regulating so and so we think about that in terms of like an immune system that's overactive and overstressed, has too much play to handle.

Then it can't focus on something new that comes up. So then when when you do something that whether that, that could be a stem cell or that could be exosome or, but peptides.

Well to me thymus it off in one will work in a similar way where the immune system will become a little bit more balanced. People will people who are, who are very sick with complex illness, a lot of times will feel a lot better when they take them.

So, it's almost I, I would think a thymus alpha one, almost like, if you imagine somebody that you see for hormone replacement where their body stops making testosterone and they don't feel great because that's a hormone that has been in their body that they've been used to having.

And you replace that and suddenly they feel better. And so that imagine that there are peptides and, proteins coming out of different glands and organs that probably are going to fade in a similar way, like hormones and many other things.

However, they're probably going to fade more quickly in people with complex illness and problems like that. That's a good analogy to think a way of thinking about it.

Have you found with I mean, I certainly I've been doing hormone optimization for, for years and, I'm sure you do some of it as well. I'm always still struck, even at this point in my career, how, amazing the effect is that a small, molecule like estradiol or testosterone can have on somebody who's either, frankly, deficient or even partially deficient.

Do you see those kinds of clinical, changes or are they more subtle with with peptides? Well, yeah, I think so. Yeah. I think even with small amounts and then the dosing, we go back to the dosing conversation that we had earlier.

But even with small amounts, you can see, we've seen profound effects for, for some people. And then, you know,

it's everybody responds a little bit differently, but everybody's got different stuff going on.

And obviously this is the the decade of the immune system. Yeah. Regardless of whatever decade we thought we were living and oh yeah, I mean, I call it the decade of the virome, but it's really because the I mean, the virome is a new, effect on the immune system.

And, but, you know, it's it's, it's absolutely going to be about the immune system in inflammation. And we know that senescent cells have caused disease and other even post mitotic organs.

So I absolutely agree with you about that. All these peptides. So then so your analogy was that these are, peptides that are floating around the blood in a healthy body, but then for whatever reason, illness or infection or stress start being produced at a lower level.

And that, puts the person into a state of last season. So in some ways, they're kind of replacement therapies that you're doing as well. To a certain extent it sounds like.

Yeah. To certain extent. Yeah. And then what I would say is, is that if you think of the big the big immune problems that we're dealing with right now are situations where there is an amount of physiological stress that's too much for the body to handle.

And now that physiological stress, maybe from an acute infection that's going on and like on the one side over here, or that can be from an overactive and inflammatory response, both at kind of a at a genetic and at a physiological at a cellular level that basically puts the body at a dysregulated state and then it leads the body becomes dysfunctional in terms of its ability to deal with that.

And so then you're you're dealing with those two things. And so then the the question is how do we a fight the infection on the one side. And so then, you know, I think peptides are not a 100% solution for that, but they're a supportive and replacement idea kind of that you can think of almost as an analogous to testosterone.

BPC-157 and connective tissue repair

And then on the other side, the question is, using using these to using peptides in a variety of other modalities to regulate basically that total inflammatory state that the body was put in.

Yeah. I mean, that's that's I was just thinking up about. You're talking about peptides. And we now have technologies to do the proteomic, analyzes. We can do, you know, look at all the the proteins are being produced, peptides as well in the body and whether there's a general decline with the aging process or within particular conditions, so that then you could even pick up which ones are declining and then replenish those, you know, the whole idea of, you know, one drug, one illness kind of thing is gone out the window.

We know we need multiple approaches to things. And that made me think about human, young human plasma transfusions. And maybe what's happening partly in those is that you're getting back those peptides that you're talking about that are getting lost.

And, you know, they don't know exactly what they are. Some people have, you know, talked about GDF 11 being an important one, but I'm sure it's you know, when you have the whole plasma being transfused from a young person to an older person, there's a whole lot of things going on there that, that need that need some parsing out to really understand the exact mechanism of what's going on.

But I wanted to move just a little bit to a molecule that I do do some work with. And that's, and you're musculoskeletal as well is a, BPC 157. And, how was your experiences with that, how that works?

Whether or not, you know, I know that you can take it orally. You can take it in by injection. Some people are injecting into that the areas of where there's, you know, the problem, is that your experience with or maybe. Yeah.

So you see one by someone's got a good one, and it's an interesting molecule. So, the it it is, secreted actually by the stomach. And then do you know the story?

The Pavlov story, I don't. Oh, so that's a good one. The idea is, is that, Pavlov, had these digestive juices, which were a kind of the tonic of the day back in Russia again.

And so then, and they helped people. And so then one of the theories is, is that there was, BPC 157 in those juices. And so that was like the first peptide therapy that was ever done.

Where did they get the juices from, from from actual humans or they but and each of them, I know they had like in some kind of an energy tube down. And I think it was from dogs.

So Pavlov's dog again. Okay. I think I think so, but I know that that he was involved in that. And so then BPC 157 is something that people will use, orally.

And so then it, it makes sense that, you could give it or at least since there's something that is secreted in the digestive system and, you know, there's two conversations around that.

One is, is that there's a, short acting, some short acting preparations, and then there's some long acting preparations. The, hypothetically, the idea is the long acting preparations are going to digest slowly, and so they're going to make it to the colon, and then the short acting ones would then, have a systemic effect.

Now, if if I called ten of my friends and pulled them and said, hey, what do you think about oral BP 157, I'll tell you that five of them are going to tell me that, oh, yeah.

They're great. And people get a systemic effect and we really like them. And then another five are going to tell me that's a waste of time and money. We notice that people haven't gotten that much of a benefit from it.

So you've got you've got that, to contend with, but, the, but I have noticed benefit with people even five, 7 or 8. And then there are some people that will combine, Cfpb, which is a basically an anti-inflammatory, fragment from growth hormone HPV, HPV.

And they'll combine that with BPC and as a supplement. And that's a small one. And so then, it has a good mechanism of action in the gut, in terms of systemic.

So then the next thing that you could do is you can inject BPC one five, seven subcutaneously. And so then you can inject that subcutaneously in your belly or a gluteal area.

And that can have a systemic effect. And I'll tell you that, people will have benefit gastrointestinal from systemic dosing and BPC 157. And so we've definitely seen that.

And we take care of a lot of patients with Sibo, leaky gut, and, and inflammatory bowel conditions, and in general, both with oral and with the subcutaneous dosing.

We've seen benefits in terms of musculoskeletal. That what I like to say is I, I like to think of kind of these five compartments of pain. So there's the nerve.

There's a ligament, tendon and fascia. There's the, the joint, there's the sub control space. And then there's the systemic blood, you know, situation, if what I'll tell you is, is the BBC 157 is incredibly anti-inflammatory and helpful for connective tissue problems.

Some people will take it as a connective tissue subcutaneously to try to have a systemic effect, which on a scale from 1 to 10, if you're trying to treat a tendon, I would call that a two.

On a scale from 1 to 10. It's not going to be that helpful. But, you know, sometimes you'll see real high end athletes

that are real super tuned and they'll be like, oh yeah, I got a benefit from that.

But so then I've got two strategies for how I do that. And one is, is that I just pinch a little connective tissue and I go subcutaneous right over the area.

And so then I well, I, you know, I've done hydro dissections with BPC 157, fascia everywhere from the neck to the back to, the groin, the everywhere in the body.

You can do hydro dissections. I've done with BPC one by seven. And I found it to be quite helpful. I like to do combinations of it with other peptides.

And so the traditional thing that a lot of people did was they combined thymus and beta for NPS in one, five, seven. For nerve hydro dissection. And so the other thing we can do is remember when I told you when I was in school just doing, putting fluid around a nerve?

We had the ultrasound and put a needle right by the nerve and put fluid around it. So then what you can do is you can do the same thing, but instead of putting rope pivoting, you could put BPC one, five, seven around nerves.

And, and I'll tell you, people will have a lot less people. It's a, it's a very good, analgesic, medication for peripheral nerves. Now thymus and beta four is as well.

And there's actually a patent out for peripheral neuropathy and thymus and beta four. I found people do better with a combination of BPC one five, seven and thymus in better form.

And then we've even used some of the fragments of thymus in beta four, like fragment 1 to 4 of thymus and beta. For us, the most anti-inflammatory fragment.

And so we'll combine that with BPC 157. Now then you say, okay, what else connective tissue wise? I live with my friend Barb, who, unfortunately, about once a month, we'll burn herself cooking in the kitchen.

And then whenever that happens, she'll she'll look at me to go, it's time for another BPC miracle. And so that I've, I've given her about 25 different injections for burns, where I'll inject subcutaneously around the burns and pour it topically over device and beta for also a very good for burns.

And so and as a kind of a shocking like we have pictures where we'll do it and it'll be like it'll heal quite quickly. You know, Addley did a trial with, BPC 157, injecting it into joints, and then I've.

I've had a good experience injecting it into the joints. I've had a very good experience with back pain. And so using both the, both combinations of, flavors and bitter for fragments and BPC, my five, seven and what, what my group of people, anesthesiologist do is we, we if we think that somebody is having pain in their joint, we do something called a median branch block where we go in and we put a needle, to right by the nerve that goes to the joint.

And then if that, if that works, then we say, oh, well, they've got pain from the joint. And so the thing that we do is we do an ablation to try to kill that nerve.

Right. The good thing is that can be helpful. The bad thing is they walk around for a couple of years, and then once the nerve comes back, then the pains were right.

And so then what our approach is, is to to treat the median branch and then treat the capsule with with BPC one, five, seven and other other peptides that are going to turn inflammation down and start to regenerate and heal the connective tissue there.

And then once those joints start to work better and function a little bit better, forest can move more freely through the spine. And then that's going to lead to less impingement of nerves.

And you. Well, so those are sort of your, some of your top, peptides that we've been talking about and the other ones in the, the, in your, I mean, I know there's quite a few peptides that you have the most familiarity with and have, want to share with our, our listeners before we turn to another subject, which I would just briefly, because I know we're running out of time a little bit, but, yeah, I'll, I'll, I'll kind of leave it there.

But one, you know, one thing, you know, I had a great we just got back from a forum and it was nice to see you and, get a chance to talk to you there.

We've been. Yeah. And we I was, talking to a lot of people about Lyme and mold and big neurological problems, which might allow us to dovetail into that segment of the conversation.

Yeah, sure. Let's start with that. But, interestingly, when you think of chronic mold, one of the strategies, strategies that people are doing is, is they're trying to regulate and balance those patients and improve them, and then what they're using to ultimately regulate genetic expression of inflammatory genes that have been turned on is a peptide called VIP.

And so that I was talking to my friend Kent Holter, who also is using, some other bio regulators. So the bio regulator, the spleen, and then the, pioneer bio regulators to start to treat the patients with real inflamed central nervous systems.

And so then I could talk to you about that, but let's go on. But then know that I think that what we're going to see is a constellation of a whole bunch of problems that are basically are all brothers and sisters and cousins of each other.

Chronic Lyme, chronic mold, EBV, CMB. And, you know, I was we maybe we could kind of go into the to 65 conversation because, you know, I also have seen to 65 be quite helpful for those patients.

And and I'm not sure if it's because you're decreasing senescence in T cells, which was some of the work that you guys just did, which I just, I like, I saw that I was like, I totally get it that, that, you know, you ever you read something and you go, oh, this is exactly how I thought I was going to be, because I had that experience that I've had so many people get better.

Tell me about tell me about that study, and then maybe we can dive into that, because I think that that's just amazing work that you did. Yeah. So it was a study, looking at, the effect of T 65 at varying doses, in 500 patients that, had levels, basically ages of 50 to 70 something.

And and what we found, for a year, sorry, nine months. And what we found was that the way in which we define a senescent cell is no longer expressing the Cd28 molecule, which is very important for a brisk proliferation.

When the T cell, hooks up to the antigen presenting cell. And so cells that are, have a, like Cd28 are really considered senescent. They, they don't divide anymore.

They secrete a lot of inflammatory cytokines. And, accumulation of those is a very bad thing that that occurs. I mean, increases your risk of cardiovascular disease has been associated with, it was one of the reasons we think that CMV is such a bad actor, even though it's most doctors consider it a benign virus.

Because it doesn't cause any major life threatening acute illness, except, you know, can cause congenital problems. It's. You get it coming through the birth canal.

But what it does is it makes your immune system continue to work very hard, to keep it late. Remember, all the herpes viruses, are once you get it, they never go away.

They sit latent, and then they can get reactivated. There was a cold sore as general herpes, as shingles for, you know, for varicella. Epstein-Barr can come and go, the, herpes virus five, though.

Well, it causes a small amount of 10% of of, you know, actual clinical mono. It's mostly when you get it, you don't know it. You might feel a little crummy.

You don't know when you're shedding the virus, but it it's actually the most challenging. For an infection in a, in human bodies in terms of the amount of immune systems needed to keep it from coming out.

And so year after year, keeping it latent in your endothelial cells and in your monocytes, you know, your your body has to use up T-cell reserves and particularly CD8, you know, cytotoxic T cells, and then the cells divide, divide.

They lose telomere length, they get critically short, they become senescent, they accumulate, cause all this senescence associated secretory phenotype.

So the idea was from our original cohort study back in 2011, when we saw that there was an effect on reduction of senescent T cells, but a greater effect in those who were CMV positive because there was a greater accumulation of them.

That was a just a cohort trial. We didn't know whether it was an actual improvement, but we saw about a 20% reduction. And we also saw an an increase in naive T cells, which can be reduced because of lack of, thymic activity.

But also because there's taking up of what we call immunological space, which is the it's a basically if you have, there's just a certain amount of space for immune cells.

And if your body senses that the space is getting too filled with one type, senescent cells, then the naive T cells can't, increase. So, when we saw that there was both a decrease in senescent cells and an increase in naive T cells, in this population, that was about 50, 60% CMV positive.

We the company then decided to do, a randomized control trial to look to see, you know, if this actually was repeatable.

Immune peptides, chronic illness, and T65

And remarkably, it was almost the exact same amount, a 20% increase, decrease in senescent cells as measured by lacking Cd28, and about a 10% increase in naive T cells in the CMV positive, but also reductions in senescent cells in the CMB negatives, as well as, increase in the naive T-cell population in the CMV negatives in addition to the CMB positive.

So, remodeling of the immune system towards a younger type of immune system. That was really was really pretty fascinating. You know, we don't know exactly what the mechanism to your point, whether it's because those cells have, been rejuvenated to a certain extent, although as we talked about earlier, it wasn't because we didn't measure an increase in Cd28 positive cells.

So were they just removing senescent cells? It's hard to say. But but definitely to 65 had that effect. Is there are there off target effects. We know telomerase can go into the mitochondria.

We know they can do as other effects on gene expression. The telomeres do. So it's it's hard to know, but but but definitely that CMV, you bring it up along with, you know, Lyme with, with, mycotoxins etc..

Anything that stresses the immune system to have to proliferate to deal with an issue, and then eventually cause senescence is, is is sort of really the where we're, we're that's where we're at war in chronic disease.

Really. So so that's, that's kind of what happened. And we saw that, it it actually some effect at 100 units, 250 units, 500 units, and then 500, twice a day.

Or 240 twice a day. You know, we saw some effect at all the doses. Doesn't necessarily mean that you can

definitely get an effect at 100. It just that was that per patient population.

So you've had experience with 65 where probably it was reducing senescent burden, particularly of the cytotoxic T cells reducing IL six, reducing TNF alpha, potentially improving the ability to create interferon gamma.

So you know, I think that would be interesting to do as well as to see, you know, whether or not in a trial with your patients being treated for those things.

I mean, I have Lyme patients, I have the volunteer 65, because it is a stress to your immune system, no question about that. That's just in a nutshell.

The the study and the, you know, all of all of the fundamentally all of those patients, my experience is, is that their killer cells are low. Yeah. So that's, that's that's really interesting.

You know, natural killer cells numbered tens with the aging process to go up. And that's what we found in the baseline. And that's what I see in my fairly large database of natural killer cells that with age, they slightly go up.

But the reason they go up is because and it's been studied by Janet Lord and other people that look at the innate immune system. Is the Purcell activity decreases the ability for grandson and B, and for foreign to to work to kill is decreased and they think there's some upregulation for that reason.

What we actually saw with the 65 in the original cohort, was a slight decrease in natural killer cell function, in the cohort with that remodeling. And it was that's back to a more useful thing.

But I know in the Lyme literature they think of, natural killer cells differently. And that you see you saying that they have low natural killer the they tend to you'll see a lot of people come in with very low.

And so then you wonder, are they out on the front lines or are those or. Oh, right. Within that population, is there more senescence in killer cells? In, in, in these patients with that are basically fighting a constant fight, for their, for their entire life.

Right. Yeah. I don't I don't think we know the answer to that. That would be interesting to see. So in terms of mycotoxins, which I don't know if, if we just briefly, for my own, interest you, how do you, how do you measure that?

And then you treat you support around it. You can actually treat the mycotoxins or can you, so then this one, this one's a good one. It's a little bit.

This one's another one that's somewhat controversial. And so there's a variety of sort of luminaries out there. But I'll just give you the sort of the highlights and the lay of the land.

The, the current sort of up to date thinking I make sense is, is that there's water damaged buildings. So then imagine that there's a water. The sheet rock is bad.

And so then there's going to be a, an opportunity there for infections to exist. And when they exist, then they're going to start to secrete, an aerosolized, plume that we could that we could breathe that.

Now, initially, it was thought that that was just making toxins. And now Shoemaker, who is probably one of the top luminaries in this field, is basically and him and Heyman, are saying that there's acting on Omics, which is gram positive rods, mica toxins and gram negative rods.

And so then and they're correlating basically from their most recent data. And I spent the entire dinner that we had together talking to Eric about this, Eric Gordon, who's a very smart sort of like I always like to if I could sit and talk to him for like, ten hours at a time, just going through the stuff.

So anyways, so then, the theory is, is that the people who tend to be quite susceptible to, to this, water damage. Well, there are people that have, biofilms and there could be a biofilm in their gut, but most likely that's a biofilm on their nose.

So they start to breathe in, and then they start to have mold that's living within a biofilm in their nose. Or it also could be the nose. And so then instead of having that plume that's secreting into the air that we're breathing is happening in your nose, and so then what happens is that leads to, making toxins living there that are secreting.

And now there's, a few schools of thought about what to do. One is, is that people will do a, a nasal swab and try to figure out if they have a biofilm.

And it's from this bacteria. Americans. And then if that's positive, then try to treat that. Other people will say, if you've got the symptoms, just treat.

So there's some ideas back and forth there in terms of, the gut. Try to do a workup and to see if there's GI biofilms and a lot of gastrointestinal things or not.

And then some people would say that doesn't matter. It's just the nose. And so then you've got both of those at play in terms of testing. There is a, antibody testing.

And so you can do, IgG and IgG testing to see if you're making antibodies to make a toxins. And Andrew Campbell's kind of a luminary who has a lab, called my microbe.

And so you can do that to try to work that up. The, there's a research lab that Shoemaker and these guys are starting to work with called the geni. And basically what that does is that looks at a whole bunch of inflammatory genes and, and we'll give you an assessment of kind of low, medium, high of how turned on they are.

And so then in that population you see these geni reports. And so they're all bright red. And so then AP genetically you walked into this water damage bill and you're breathing it in.

You've got a biofilm, the molds living there. And so then your brain goes, oh, holy crap, this is end of days. And so it starts to print fight or flight, inflammatory, aspects of your genome, which is just going to hypothetically help you respond to this insult.

But the reality is the response may be out of proportion to the insult and maybe causing more damage than the insult. Right. And then finally, with respect to that one, then there's, people will do, an assessment of urinary mycotoxins.

And so then the urinary mycotoxins, there's a couple labs, Great Plains in real time. And if you want to have controversy, just go find a bunch of mold doctors and ask them which one is the best.

And, even though it a bunch of them are going to say the urinary mosquitoes and testing is totally invalid, then some are even going to say the antibody testing is invalid, but you know, it exists.

And what I will say is, is, You will occasionally see people with significant moral problems that will have unbelievably high levels of certain neurotoxins, like Leo toxin for example.

And it seems out of proportion that you could pick that up from food. And so that I think that there's probably a space for all of this testing. And so then the question is, well, what are you going to do about it?

And so then one thing is, is that there's if you want to have more controversy, go ask a mole doctor, what, what binder should you use to help these patients?

And so then there's gonna be a whole bunch of different ones. Yeah. Light and bentonite and and and color styrene and all of these charcoals. But basically what happens is, is you're taking something that is, Chris Shade has one,

two you're going to have takes something that's, binder that's going to bind onto that mycotoxins.

And it could be, it's going to hold on to that. And that binder is part of a big molecule. It's going to pull that out of the body. So then the idea is the idea is 1.0 fix mark ons.

And so then, you know, there's a anti-microbial peptide called el al 37. And so we mix that with a xylitol nasal spray and then have people do that. And that can help for Markos.

You can do colloidal silver. You can even do like Betadine rinses. And then there's the traditional thing that most people did was a, a long approach of, anti-microbial antibiotic combinations, because the classic one big spray of putting is up in the nose to try to break down those biofilms and eliminate where the molds living in the body.

So then, but so then traditionally you're trying to work on that, remediate the house and then, work on binding. And then once you get people 70, 80% better, then the, the ultimate kind of cured of, of of at, at a genetic level of regulating the, out of the inflammatory genes back into kind of a more homeostatic situation was done with that peptide that I told you about the IP.

And so then my my sense is, is that some of the bio regulators will really help this population feel better, and particularly the brand bio regulators, the pioneer by regulators, the spleen, bio regulators.

And so then the problem is, is the VIP, if you give it to somebody that's really sick, they get worse. And so there's been a the whole thing in the mold community was to basically try to treat people.

And then, you know, I first found out about this ten years ago, and I had people that were had been doing it for like two years. They were like, I'm waiting to get the VIP, but I'm.

And then I even knew some people at that point who did VIP, but they did it too early. And then it was like a catastrophe. So then that kind of made me nervous of the whole mold thing, and I was like, I don't think I'm going to do that.

You know? It's like so kind of tricky to handle now. I think we do a lot better because they tend to respond quite well to the immune peptides, they tend to respond to the bio regulators and, and even, whole staff is telling me that he's using the bio regulators orally for a lot of these patients.

Mycotoxins, mold illness, and immune dysregulation

And there is a big overlap between Lyme and mold and, and and then what happens is, is within that there are a host of basically symptoms that come out that these patients will have.

So they'll have this autonomia and so they'll stand up and they can't be a constrictor of blood vessels. And so they get lightheaded and pass out. And so, there's they'll have mass cell activation.

And so then basically, all of the symptoms are somehow related to immune system dysregulation and the different aspects of the body not working together to, to do whatever it's supposed to do, because it's in a state of constant inflammation and stress.

So then the the idea is knowing that you can kind of build a model of how you can think about mold within mold to kind of circle back to the answer. I think you got to figure out all of these other things.

And what I think is, is that they did incredible work on a mold, but I but the reality is mold is not mold. To go back to the beginning of my answer, right.

Mold plus these other bacteria here. And so then oh if it's mold places, other bacteria, what do we see a lot of in our practice mold. Plus a couple other bacteria plus Epstein-Barr and CMV.

Like if you start to test in this population, you're going to start to see everybody, everybody. This with those symptoms has 4 or 5 things. And then what's going to happen is, is if you have somebody that comes in, and they've got catastrophic long Covid usually, I look and I find several of those things.

And so you wonder, did Covid trigger those or or did they just did Covid trigger all of this all by itself? And I think they're basically all in a family.

And so then we're going to begin to understand them. And then what do we have to do? We have to do things to regulate their immune system. We have to do things to turn down these inflammatory mediators, turned down IL six, turned down TNF alpha and and then what is that that then interestingly 65 actually comes back, I think as something that could be kind of a home run, having a variety of different mechanisms.

Protecting our DNA and then supporting people as they go through fairly big immune problems. Yeah. It's interesting that there was a, you know, a hypothesis, by, Abraham Abebe about, you know, the overwhelming of the immune system that Covid does in severe Covid cases and that maybe because of shortening of telomeres in it could potentially help in that's a cute version of sort of the longer version that maybe from a chronic, you know, infection with Lyme or mold.

And and it all goes back to basically reserve. And then when the reserve is lost, the senescence causes this dysregulation, of the immune system. So it's, yeah, there's a lot more work to be done.

But what's always fascinating for me is how, in particularly doing the Telomere Summit is talking to people about their disparate areas. But there's common physiology, common, common mechanisms, that, that come together to sort of make the whole thing kind of make sense.

And, and, you know, that's what's been really kind of fun and also good for patients. I really want to thank you for, for this really interesting conversation.

I know that, so you have a practice called bio reset. Anything you want to tell our listeners about that? How to get in touch with you if, if you have.

Yeah. Yeah. Thanks. Go to bio reset.com. And so then we, we do a host of things. We take care of these complex immune problems. We, we try to do an integrative approach.

We do everything from plasmapheresis to peptides to supplements. And so a diversity of different things. But what I found is everything that is helpful and, works well for really, really sick patients will help healthy people do better.

So we do a lot of concierge wellness, around similar modalities. Sure. Which which I think is fun. And then we take care of a lot of complex, you know, pain and sports medicine problems.

I'm curious, just, as a last question that popped into my head, in terms of, sort of assessing these patients with these chronic immune inflammatory disorders, do you use glycan age at all in your practice?

No, no. Tell me about it. Yeah. So glycan age is something that would be really fascinating for you. It's it is based on the glycosylation of IgG, the sugar, non glucose, saccharine polysaccharides that are attached to, IgG and is the sort of the fourth signaling way in, in the human body, there's a whole area of, glycosylation of lipids.

You think of like, like, okay. Like, so the arterial system, that's all sort of the same thing, but within the immune system. Gordon laughs. Who's from, where is he from?

Not the Czech Republic. Croatia. Sorry. He has yeah, he's the world leader on this. I've had him on, on the Telomere Summit, but he has a test called glycan age, which is based on a large database of looking at how what the pattern is, on, these, on the IG of this, of these saturates and, it turns out that that pattern changes quite characteristically from young age to middle aged all day.

So you can give them a glycan age, which is a pattern that's equivalent to a 55 year old versus a 35 year old. And what they. So in your patients, I would think that there's probably significantly older glycan age, because of their immune dysregulation.

People that have it's not just a marker in people that have that more that older, pattern. Their, their immune system is much more inflammatory. They can activate complement more easily.

They cause more inflammation. And people who have older glycan ages have worse Covid outcomes than people who have younger glycan ages for their chronological age.

So, it's a test that you. I'll take a look just like an age.com. Definitely something that would be interesting to see. You know what therapies. One thing that we've seen in our practice, which is really fascinating, is that hormone replacement therapy, both in males and females, testosterone in males and females causes a massive reduction in glycan age in patients 1015, up to 25 years of reduction in their glycan age.

Because of the changing of the pattern that the hormone replacement therapy does. And which is, you know, why perhaps hormone replacement therapy is anti-inflammatory in, in women.

So just another thing to to think about in terms of testing. And I'll be happy to offline, you know, tell you more about it. Yeah. I would love to. I went to a lecture on it at a forum, and, who gave that?

Not Gordon. Wasn't Gordon, I don't think. No, I didn't know who it was. The I didn't, I didn't I didn't catch their name. But, it's, isn't it. So then that basically it's almost kind of analogous to you don't want too much like fossilization of your hemoglobin or anything, basically.

No, it's not that. So that's the interesting thing. Like people think that that's what it is and that's perfectly reasonable. But it's not about they're not glycation end products.

This is actual, these are these are supposed to be on there. And the pattern is determined by post length translation. Modification of the IG. And so, you know, it's actually not about, you know, diabetics honestly have that.

It's not it's not about, sugar glucose molecules being attached. It's non glucose molecules, mucus mannose, sialic acid. There's a whole literature on it.

And I bet you're going to be fascinated when you dig into it. Okay, I can't wait. Thank you so much. It's super nice to talk to you. Yeah. You too. And thank you for taking the time.

Hope to, catch up with you again at the next meeting fairly soon. And thanks again. Awesome.