Unlock The Brain-Immune-Gut Longevity Link Transcript

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Introduction to Dr. Kan and the Brain-Immune-Gut Axis

Welcome to the Fasting and Longevity Summit. I'm your host, Dr. David Jockers And today I'm excited to interview Dr. Peter Kan. We're going to talk about the brain immune gut connection and how that relates to inflammaging and longevity.

Very powerful topic. A little bit about Dr. Kan. Dr. Kan is board certified in integrative medicine, functional medicine and Chiropractic Neurology. He's a creator of neuro metabolic integration, which is a science based program that identifies the root cause of autoimmune and other chronic conditions.

Over 6000 patients from across the country have come to seek out his holistic approach. That's changing the lives of those suffering from chronic conditions.

He was born in Taiwan and he immigrated to America at the age of 13. And Dr. Kan has a deep appreciation of the Eastern wisdom and Western advances in natural health care.

He believes in the God given ability of the body to heal and regulate itself. You can find him at askdrkan.com This is a really powerful interview. We go through a lot of really great connections between how the brain communicates the immune system and communicates to the gut, and how when there's dysfunction in any of those communication pathways, it's going to contribute to inflammaging or really inflammation which ages us and breaks down our ability to live long and healthy.

So I know you guys are going to get a lot out of this and please share with anybody that you know and that you care about. And without further ado, let's go into the interview.

Well, Dr. Kan, I always enjoy our conversations. You're one of the leading minds when it comes to functional medicine. And, you know, you really you really break down this idea of the brain immune gut.

So well, you know, you call it the big idea. So let's go into that and how the brain immune system and gut and that connection really, really plays a role with how well we age.

Yeah. Thank you so much, David, for having me.

Inflammaging and Why the Brain-Immune-Gut Connection Matters

And this topic is is really if you look at the literature and we look at aging, we look at inflammaging, which is the concept of aging as a consequence of inflammation, we start to see that the connection between the brain immune gut becomes very, very clear, and that's brain immune gut access is the connection between the brain, the immune system and the gut.

And of course, you know, many people have heard about the brain gut connection or the gut brain connection. The gut is a second brain, like all the stuff has been out for, you know, closer to decades now.

It's very, very clear to us that there's a brain gut connection. But I think the immune system is actually like the language that's being spoken between the brain and the gut and that language that's spoken through the immune system, through the cytokines and the various interactions between T helper 1, T helper 2, T helper 17 and all these helper immune cells is what's called the action coordinating action between the brain in the gut.

And if this brain, even gut axons start to falter, you start to get this cascade and downstream domino effect of inflammation that begets more inflammation.

And pretty soon we have a chronic inflammatory condition on our hands that can really speed the degeneration of our brain, of our gut, and really overall, our immune system as well.

Meaning it can cause this accelerated senescence of our immune system and lead to a decrease ability of our body to fight off infection. And remember, elderly people as we age, the elderly population are the ones that are more immune compromised.

Right? So if they get pneumonia, you know, is worse off for them. They get cold. It is worse off for them because there is already age related immune senescence where the immune system doesn't work as well.

And if you add inflammation on top of that, it's going to further degrade the immune system's ability to fight off infections. And remember, infections in and of itself is inflammatory.

So then the more and the more your immune system can fight things off, the more inflamed you get. So what we see is that when any one of these brain immune gut access fails or starts become dysfunctional, the other two area dysfunctions as well.

So there's a connection. So this is why sometimes it's kind of hard to see chicken or the egg. Is it the gut that starts the dysfunction is the brain that starts at dysfunction, as is the immune system.

I think for different people it can be different. For some people they had a concussion and the problem started in the brain and then started getting gut dysfunction and inflammation as a result of that concussion.

For other people, it is immune system. Maybe they had some kind of severe infection or acute infection. And then that kind of started this inflammatory issue, maybe this underlying cytokine storm that they just can't put out and that sort of degraded gut in the brain.

And then yet for another person, it may have started with the gut due to chronic dysbiosis from poor diet, standard American diet or whatever other reason and that sort a cascade of brain issue and immune system problem.

So I think understanding that affords us the opportunity to kind of step back and look at the big picture. Thank you very much. And of the brain and you've got access and then be able to start to kind of pull out different information from there and say, okay, where can we start to apply to intervention now?

Give that person the best chance to recover. Yeah, that makes a lot of sense. You know, a lot of times people are dealing with inflammation and we think, okay, well, we'll just throw anti-inflammatory, whether it's anti-inflammatory medications or anti-inflammatory supplements like turmeric or proteolytic enzymes or something like that, because they're dealing with then with inflammation or, you know, obviously a lot of people turn to taking Tylenol, Ibuprofen, aspirin.

They're not really getting to the root cause or treating it downstream. So what you're saying is, let's find out where the root cause is. It is is it, you know, this immune senescence where you've got kind of these age dysfunctional immune cells that have built up that are just spreading out, you know, inflammatory cytokines, creating kind of like this low level stealth inflammation in the system.

Is it an issue with brain right.

Finding Root Causes: Oxygen and Blood Sugar

Is a brain not firing? Well, because you mentioned trauma, concussion, something along those lines or is it something going on with maybe a gut infection, low stomach acid levels?

Right. A lot of these these factors down there with the gut and actually going upstream. That's obviously why, you know, you've been so successful helping people is you're not just throwing, you know, a medication or a supplement at a symptom downstream, but you're going upstream to get to the root cause.

The whole lot. We're looking at mechanisms. Exactly. Yeah. And I think that's so important where people are looking to improve their longevity. Perhaps they have, you know, an autoimmune condition or maybe neurodegeneration in their family, you know, and they want to make sure that that doesn't happen to them.

Clearly, you know, we've talked I've talked about this and I talk about it all the time is we got to get inflammation under control. That's so important as people age.

There's this condition of inflammaging, right, where it's like this low level inflammation that's accelerating the aging process. So we've got to address that.

But most people are wondering, where do I really start with that? That is a great question. Where do you start with that? And I think this is the reason why the brain immune gut axis can be a framework to help people to understand where they may want to start with that and to to kind of go a step further.

I think there's also a roadmap that people can adopt in deciding where to start. And usually where I have people start is start with things that affect the metabolism that will what I called a neuro metabolic function.

And neuro metabolic function means how the metabolism of your body is impacted by brain function and how brain functions impacted by metabolism. So this all comes down to fuel delivery, which means ability of our body to deliver fuel so we can make energy from that.

And fuel delivery is determined by two factors. Number one is oxygen. We have to have proper oxygenation to our tissue so that our mitochondria can actually turn that oxygen into energy.

And then secondly, we need proper blood glucose delivery. So we break down food from our nutrient and it eventually ends up in a school coast where obviously we have alternative source of fuels like ketone is we can also burn protein and fat, but glucose primarily speaking in a fat state, right.

Unless you're in a famine situation, typically in a fat state, your body's going to prefer glucose. So oxygen and glucose is like the currency in the body.

That's the fuel that your body need in order for your brain cells to thrive, in order for your muscle cells to thrive and or for everything to thrive.

And many people or it's very common for people to have either oxygen delivery issues or blood sugar delivery issues. So the way that may look like clinically and the oxygen issue may be someone has anemia and anemia as defined as having low red blood cell, hemoglobin or hematocrit.

These are replace cell markers that indicates how well you better able to deliver oxygen to your tissue. Having anemia would deprive your body of ability to deliver oxygen to your tissues through the blood.

Now, there are many different causes of anemia. Not all anemia is due to iron deficiency, although iron deficiency is one of the most common type of anemia.

But there are many different ways you can be anemic, not the least of which is the anemia of chronic disease. This is literally an actual condition called anemia, chronic disease, or we can call it anemia of inflammation because you're inflamed.

And that inflammation is literally damaging your red blood cell, causing the loss of red blood cells. So you appear anemic. But because the red blood cells being destroyed or damaged by the inflammation itself.

So there are many reasons for anemia. We need to identify the true reason which can be even low stomach acid, as you alluded to earlier, which can be absorption issues, could be pylori, could be parasites, could be a lot of reasons.

So we need to identify that. But anemia is a big, big deal. And another reason for people to have low oxygen is if they have low blood pressure. High blood pressure can do it, too, actually, because when you have really high blood pressure, you have a lot of basal constriction.

And if you constrict that blood vessel so much, it's kind of like putting your thumb at the end of our nose. You're going to have a lot of pressure in a host, but the amount of volume of fluid coming out of that hole is going to be less than if you just open it up the garden hose.

So people with a very high pressure or with low pressure, both are going to have decreased perfusion to the tissue, which can again affect oxygen delivery, which then again affect their ability to make energy.

So that's on the oxygen side, then on the blood sugar side, then this is something that you talk about a lot. Obviously an expert in this area and this is something I talk about a lot, too, because it intimately affects people's brain function, their mood and just their overall health, which is blood sugar, needs to be optimal.

The body's pretty obsessed with keeping blood sugar at an optimal level, that it has multiple hormones that are all monitoring this. And so in people who have low blood sugar and or insulin resistance, resulting in high blood sugar and or both, where their blood sugars up and down like a rollercoaster, they're not going to do very well because they don't have steady fuel delivery.

The analogy of this might be a car that has fuel injection, right? So you've got to get the gas into the engine block so you can have steady gasoline delivery to the burn.

If you don't have a good fuel injection system where the gas goes into the engine block sometimes but not other times, then the engine's going to sputter and jerk and it's not going to work very smoothly.

A lot of people have unstable blood sugar to the point where the energy level, which is up, down, up, down all day and the mood goes with it, and then really the metabolism goes with it.

And that's sort of drag down the hormone function, their immune function. So blood sugar is another key pillar here. So the question is, where do people start?

I always have people start with looking at oxygen problems and blood sugar problems. That's a great place to start. Yeah, it's really, really good in-depth answer right there.

So addressing those things is super key here. Now we start to look at how people age. You know, in our society, we have an epidemic of neurodegenerative conditions, cognitive decline, Alzheimer's disease is on the rise.

And so what is what is actually happening in these individuals brains as they're aging compared to somebody that's aging successfully? Right. That's aging. Well, what is the difference?

What's actually happening there?

Neurodegeneration, Mitochondria, and Brain Aging

Yeah, what we see in people with neurodegenerative disease, such as Alzheimer's disease or Parkinson's disease or various different types of dementia, is that typically is typified by the build up of these neurofibrillary tangles or tail proteins or whatever.

But these where you have these protein aggregates that sort of build up now these protein build up, these misfolded proteins that build up in the brain do not intend to ever solve a problem because that's a normal process of your brain trying to, you know, wall off something or get rid of something that doesn't want.

So it's essentially kind of like inflammation, right? Inflammation is not good or bad, right? We kind of say inflammation is all cause of all disease.

No, inflammation is not the cause of all disease. Chronic inflammation is the cost of all disease. Inflammation is just something that a body naturally has as a way to help us to fight off infections.

So these misfolded proteins in our brain are a natural process of your brain trying to maintain itself. But when you have excess amount of these misfolded protein buildup, then that can start to impair circulation or neuroplasticity, synaptic transmissions.

Then we start to get these now degenerative issues. Now the question is what? What will cause these misfolded proteins to even show up in the first place?

Well, a big driver is, as we talked about earlier, these fuel delivery problems. Right. When you have fuel delivery problems, what happens is your mitochondria reduce energy efficiently and mitochondria have within themselves these mitochondrial quality control mechanisms right through mitophagy and through mutagenesis or mitochondrial biogenesis.

So mitochondria has a way to maintain its own function because mitochondria DNA doesn't have the capacity to repair itself like a regular cellular DNA does.

So it does these processes to help maintain itself. And we don't have proper energy production due to fuel delivery problems. Mitochondrial functions start to degrade, and with that it comes with decreased energy production, but also increased oxidative stress.

And oxidative stress causes, you know, this this damage that happens that's part of aging. In fact, the reason we age is because we're oxygen breathing animals, right by aerobic respiration.

The fact that we burn oxygen for energy, what comes out of that as a byproduct is oxidative stress is oxidation. So it's normal, but it builds up over time.

And that oxidative stress basically causes ourselves to age over time. This is why we age and this is why, you know, eventually everything shuts down and this is why eventually we all die, right?

Not there's nobody die escapes us. Only one person did. But other than that, in history, nobody else has. So the the the a fuel delivery problem can causes mitochondrial issue, which leads to that.

And secondly, inflammation itself is also another thing that's typified in people with neurodegenerative disease, because the inflammation can also cause mitochondrial problems.

So in essence, if you can make energy, your brain cells are going to suffer because of your brain is very sensitive to energy demand. And then also, if you're inflamed, your brain cells doesn't work very well because these brain cells can degenerate faster in the presence of a energy deficit or inflammation which causes microglial activation, which causes this widespread brain degeneration.

Yeah, it's powerful stuff right there. And so how does you know, you talked about oxygen, you talked about blood sugar, stability. How does that play a role in neurodegenerative conditions?

So when people have let's start with blood sugar, it's very well known that if you have blood sugar issues such as insulin resistance and the result of that, you may have higher levels of hemoglobin A1 C, which is a blood test marker that indicates this glycation damage from higher blood sugar.

Basically, when you have high blood sugar, the the sugar molecule causes this damage to your cells and that damage can be measured. So hemoglobin A1 C researchers have shown very conclusively that high hemoglobin A1 C is associated with increased risk for Alzheimer disease.

And the number that we'd like to see is, you know, below 5.5, five or below to begin with, but even lower numbers like 5 to 5 one or even 5.0, maybe even more optimal.

So that's where the blood sugar issue can relate to neurodegenerative disease simply through the mechanism, the insulin resistance and the advanced glycation end product.

On oxygen side, if you have oxygen issues, this can show up. I mean, one way to show up is people with dementia. That's of the ischemic type ischemic dementia.

So what that means is they have lack of they have mini strokes in the past little blood vessels that pop off.

How Gut Dysbiosis and Leaky Gut Drive Brain Inflammation

And so they don't deliver blood to brain tissue anymore. And these things develop over time. And so that brain cells get starved of blood flow. Therefore, oxygen.

And that's a mechanism of people developing dementia as a result. Now, lack of oxygen in and of itself is inflammatory. When cells undergo hypoxia or low oxygen states, it triggers all of this inflammatory cascade.

And basically you get inflammation directly from a hypoxic state. So chronic hypoxia is very damaging to the brain. And we already know that. Most people know that if you go without oxygen for 5 minutes, your brain cells are gone, the dead, and you don't get those back.

This is why if you drown or you don't have oxygen for 5 minutes, that's it is a irreversible. So that just tells you how sensitive your brain is to oxygen deprivation, even a mild, low grade, low oxygen stage, chronically.

That can still be an issue. Yeah, so important. And then how does the gut like if there's issues going on with the gut, let's say gut dysbiosis, leaky gut issues like that, how does that actually contribute to cognitive decline and neurodegeneration neurodegeneration as well?

Yeah, this is a huge area in research at this time where we're looking at how the gut impacts the brain. And in just a couple of different ways, you start you talk about leaky gut and dysbiosis.

So starting with dysbiosis, when you have dysbiosis, that means a ratio of various bacterial populations has been altered. So we kind of have a set point.

Each of us kind of have a fingerprint of what our the ratio of the different bacteria. I don't like to use the words bad bacteria or gut bacteria because they're all kind of there right now unless you get like, you know, acute, you know, traveler's diarrhea, gastroenteritis because you got food poisoning.

Unless it's that situation in a regular situation, we all have bacteria in our gut. So I don't want to call them good or bad because they're all there for a reason.

But if the ratio of them are offset, where some bacteria are grown too much and others not growing up, that's the definition of dysbiosis. So we're location wide too, right?

If they're in. This, absolutely should in the ratio of them and what they're doing and because of dysbiosis, then you start to produce metabolites, right?

Chemical byproduct of these bacteria that are also in the wrong ratio compared to when those bacteria different ratio. And these metabolites sometimes can be a problem and these metabolites literally can crawl up through the entire nervous system, through the vagus nerve up to the brain.

And if this metabolite is a type of metabolite that's can be toxic or can trigger inflammation, then you're going to have this chemical or even misfolded proteins that we talked about earlier that can start in the second brain, in a gut, in enteric nervous system, crawl up the vagus nerve into the brain and then cause neurodegeneration.

So that's the biggest biotic side on a leaky gut side. We know that the intestinal barrier, the side of structure of the

intestinal barrier is very similar to the site or structure of the blood vessel that supply blood to the brain or the blood brain barrier.

And so when you get leaky gut, that means that you're going to develop antibodies to various tight junction proteins like Zani, Lin and actin and occluded and turns out in the blood brain barrier you have the same exact subtle structure xiaolin when a clouded occluded.

So the antibody to those structure in the gut is going to circulate in the blood. But when you see those same structure in the blood, the blood brain barrier is going to launch an immune attack on that.

So then this is the reason why we say leaky gut causes. Leaky brain got on fire. Brain on fire is because the similarity of structure and when you have leaky gut, oftentimes when it starts to develop leaky blood brain barrier, which means that chemicals that normally doesn't get through to the brain now can get through to the brain.

And we're going to sort of trigger this neuro inflammatory process, microglial activation and even neural autoimmunity. And that all spells inflammation, which causes accelerated neurodegeneration.

Yeah, it's all interconnected, inner combined and that's why you have brain immune gut and how it's all connected and so, so important that people understand that.

Now, Dr. Kan, what are some of the best strategies like? What are things that you're doing on a regular basis that you recommend for your patients to do to make sure that they keep this brain immune gut connection functioning as well as possible and keep inflammation under control so they can age successfully.

Thank you for that question. I think there's two main ways to look at it. One is what are some things that people universally everybody should be doing, whether you're sick or not healthy or not, everybody should be doing.

And on the other hand, there might be something that's more specific to people with certain type of pathologies or conditions that they need to be more specific with a diagnosis or assessment or intervention.

So let's start with the stuff that everybody can do. The stuff that everybody can do relates to kind of what I said earlier, fuel delivery, right? So we can all can improve fuel delivery.

That's what we can start in oxygen. How can we improve oxygen? Well, that's where exercise comes in, right? If you don't have anemia or you don't have any malabsorption issue that's causing you to have oxygen issue, if everything's good, what can you do to improve longevity and help you help yourself?

That's where exercise really comes in right now. There's many different forms of exercise. We have lows it low intensity, steady state cardio. We have high intensity interval training.

We have resistance training, even, you know, flexibility balance training.

Practical Strategies for Longevity and Healthy Aging

So there's different dimensions to fitness, right? Just like there's different dimensions to our health, mental health, physical health. So fitness is a big topic.

But I think in general, though, most people need to improve their cardiovascular fitness, aerobic fitness, which means they can start with low intensity, steady state aerobics, which means literally going for a brisk walk, maintain that intensity for long periods of time, however long that person's conditioning can.

So, you know, you want to get up to 30, 45 minutes a day. I mean, you can do that every single day because it's low intensity. Therefore, it doesn't stress out your adrenal.

It doesn't stress how you're doing. So and of course, different people, if you're more in shape, that low intensity,

maybe a higher level than somebody who's just beginning to exercise.

So you need to find out what that is for you. But that's really important. And then resistance training is going to be really important because those are age related.

Sarcopenia We tend to lose muscle mass. As we lose muscle mass, we lose one of the biggest source of glucose disposal, right? Because glucose burns the muscle you stored glycogen there.

So having good muscle mass is important for a quality of life for activity daily living, but also metabolic health as well. So I say resistance training and cardiovascular, that's for everybody.

On a blood sugar side. It's really about a lot of what Dr. Jockers has been teaching everybody, which is, you know, using a lower carbohydrate diet right now.

Not everyone needs to be doing keto all the time. Some people, it's just not a thing for them because they have trouble with fads or they just need don't need to go to that extreme.

But I think we all can be watching our processed sugar intake, our refined carbohydrate intake. We can reduce them increasing more protein, especially as you start to exercise.

Of course, exercise also help with the blood sugar, too, but on a dietary side, intermittent fasting can be a great thing to kind of reset that blood sugar in people who can handle it.

They can do longer fasting, which is great for many, many reasons that, you know, many of the other speakers talk about in the summit. So from a dietary perspective, make it simple, right?

Don't make it too complicated. You have to follow all these rules. The rule is don't spike it. Why sugar? And you can just simply do that by having good quality protein, good healthy fat, lots of fiber and then carbohydrate depends on what your needs are.

Some people can do more, some people do less. So that's everybody. And then for people who have specific conditions, then this where a road map can help.

Now I say road map, it just means a way of approaching the problem. So you're not getting confused that you think you have 20 things wrong with you, even if you have 20 symptoms and may only have a few root causes.

So we can go more upstream then and do it in a specific sequence. It might be easier for people because they'll be doing things in a specific way that's not going to cause them to, you know, take like 100 different supplements because then they're just kind of guessing, right?

So that the road map is address the physiological priorities first. So again, that comes down to fuel delivery. And then the next step I would address is digestion.

By the next step I will address then will be inflammation and walk on down the road. But, you know, if people would just get fuel delivery right, get the digestion right, get the inflammation down, you already cover 80% of it and then the rest of it detox.

Or if you have an underlying infection, it'll be easier to address those things if you've got the first three steps correct because your body is in a position.

Yeah. So key. And just to tag on with exercise, even just just walking, just going out for a walk. I mean, these stimulate, stimulate your lymphatic system, you also help activate BDNF brain derived neurotrophic factor and you and especially if you're building muscle, if you're doing some resistance training, you're releasing a lot of myokine And these myokine really help up regulate different nerve growth factors that create more plasticity in the brain, strengthen and enhance the health of your neurons.

And so really good for preserving your brain exercise. One of the best things you can be doing. So powerful stuff. Well, Dr. Kan, I know this has been great.

This information has been awesome. I know our audience really loved it. What where can people find out more about the roadmap, the brain immune gut roadmap that you have put together and how they can go down that path if they've got some sort of chronic disorder.

Yeah. Thank you, David. And the best place to find information about that is just at our website at askdrkan.com And also they can find me just on the Internet by just googling my name. Dr.

Peter Kan, I have YouTube's presence There is social media where there's free videos and they can find information about that. Great. Thanks so much, Dr. Kan.

You're a wealth and knowledge and you always provide great insight and really break down this physiology and the connections between the brain, the immune system and the gut. So well.

So appreciate your time and guys, we'll see you all on a future interview. Be blessed, everybody.