Unlock The Brain-Immune-Gut Longevity Link Transcript

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Introduction to the Brain-Immune-Gut Connection

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

Very powerful topic. A little bit about Doctor Kan. Doctor Kan is board certified and integrative medicine, functional medicine and practice 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 Doctor 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 inflammation 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 it with anybody that you know and that you care about. And without further ado, let's go into the interview.

Well, Doctor 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 for having me.

Why Inflammation Drives Aging and Chronic Disease

And this topic is really if you look at the literature and we look at aging, we look at insulin aging, 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 this brain immune gut access is the connection between the brain, the mean 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 the second brain, like all the stuff has been out for, you know, close to two 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 is being spoken between the brain and the gut, and that language that's spoken through the immune system, through the saddle tines and the various interactions between t helper one, T helper two, T helper 17 and all these helpers immune cells is what's coordinated action, coordinating action between the brain and the gut.

And if this brain even got access, 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 infections.

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, it's worse off for them.

They get Covid, it's worse off for them because this is already age related immune senescence. What 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, right? So then the more the more you 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 that the brain that starts with this function is an immune system?

I think for different people it can be different, right? For some people, they had a concussion and the problems started in the brain and then start to get 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 cute infection. And then that kind of started this inflammatory issue, maybe this underlying cytokine storm that they just can't put out.

And massages degrade the gut in the brain. And then yet for another person, it may have started with the gut due to chronic dysbiosis from poor diets and American diet or whatever other reason and massacre cascade of brain issue and immune system problem.

So I think understanding that force us the opportunity to kind of step back and look at the big picture. Thank you very much. And after brain, you got access and be able to start to kind of pull out different information from there and say, okay, where can we start to apply the intervention that will 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 medications or anti-inflammatory supplements like turmeric or proteolytic enzymes or something like that because they're dealing with 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.

Fuel Delivery: Oxygen and Blood Sugar as Root Causes

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 spotting out, you know, inflammatory cytokines, creating kind of like this low level stealth inflammation in the system.

Is it an issue with brain? Right. 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. And 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.

So 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 all and I talk about it all the time is we got to get inflammation under control. And that's so important.

As people age, there's this condition of inflammation, aging, 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 got access can be a framework to help people to understand where they might 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 what I call it, a neural 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 right. 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 eventually ends up in it's glucose. Obviously we have alternative source of fuels like ketones. 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 is 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, in order for everything to thrive.

And many people or is very common for people to have either oxygen delivery issues or blood sugar delivery issues. So the way that may look like clinically an oxygen issue, maybe someone has anemia, right?

And anemia is defined as having low red blood cell hemoglobin or hematocrit. These are replaced markers that indicates how well you better able to deliver oxygen to a tissue.

Having anemia would deprive your body of an ability to deliver oxygen to your tissue 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 cell.

So you appear anemic. That but because the replace is being destroyed or damaged by the inflammation itself. So there's 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 HP, it could be parasites, could be a lot of reasons.

So we need 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 a thumb at the end of a garden hose. You're going to have a lot of pressure in a hose, but the amount of volume of fluid coming out of that hose going to be less than if you just open it up the garden hose.

So people with very high pressure or with low pressure, both are going to have decreased perfusion to their tissue, which can again affect our oxygen delivery which then against 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's intimately affects people's brain function, their mood, and just the overall health, which is a lot, needs to be optimal, right?

The body is pretty obsessed with keeping blood sugar in the optimal level that 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 the blood sugars up and down like a roller coaster, 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 got to get the gas into the engine block so you can have steady gasoline delivery to to 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 is going to sputter and, you know, jerk and it's not going to work very smoothly.

A lot of people have unstable blusher 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 starts to 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 blush other 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.

How Neurodegeneration Develops in the Brain

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? 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 tau proteins, or we'll call it tau, where you have these protein aggregates that start to build up.

Now these proteins build up these misfolded proteins that build up in the brain do not in and of itself 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 and 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 cause of all disease. Inflammation is just something that our 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 proteins build up, then that can start to impair circulation or neuroplasticity synaptic transmissions.

Then we start to get these knowledge issues. Now the question is, 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 you mitochondria cannot produce energy efficiently and mitochondria have within themselves these mitochondrial quality control mechanisms.

Right through my and through middle genesis or mitochondrial biogenesis. So mitochondria has a way to maintain its own function because mitochondrial DNA doesn't have the capacity to repair itself like regular cellular DNA does.

So it does these processes to tell maintain a self. And when you 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 increase oxidative stress and oxidative stress causes, you know, 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 our cells 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? There's nobody that escapes this. Only one person did. But other than that, in history, nobody else has.

So a fuel delivery problem can cause this mitochondria issue, which leads to that. And then 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 your brain's 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 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, A onesie, which is a blood test marker that indicates this glycation damage from higher blood sugar.

Basically, when you have high blood sugar, the sugar molecule causes this damage to your cells, and that damage can be measured through hemoglobin A1.

Research has shown very conclusively that high hemoglobin A1 is associated with an increased risk for all time

disease. And the number that we like to see is, you know, below 5.55 or below to to begin with.

Gut Dysfunction, Leaky Gut, and Brain Inflammation

But even lower numbers like five 2 or 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 of insulin resistance.

And this advice glycation in product on the 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 ischemia type, right.

Ischemia dementia. So what that means is they have lack of they have mini strokes in the past little blood vessels that pop off. 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 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 five minutes, your brain cells, you know, they're gone.

They're dead. And you don't get those back. This is why if you drown or you don't have oxygen for five minutes, that's it is irreversible. So that just tells you how sensitive your brain is to oxygen deprivation.

Even at mile low grade, low oxygen states 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 disposes leaky gut issues like that.

How does that actually contribute to cognitive decline and neurodegenerative neurodegeneration as well. Yeah. This is a huge area in research at this time where we're looking at the how the gut impacts the brain.

And in just a couple of different ways, you you talked about leaky gut and dysbiosis. So starting with dysbiosis when you have this biases, that means the ratio of various bacterial populations has been altered.

Right. 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 that bacteria or good bacteria because they're all kind of there right now unless you get like, you know, acute, you know, travelers 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 like to call on good or bad, because it's all there for a reason.

But if the ratio of them are offset, where some bacteria are growing too much and others not growing up, that's the definition of this biases. So there are location wide to right if they're in this absolutely in the ratio of them and what they're doing.

And because of this then you start to produce metabolites right. Chemical byproduct of these bacteria that are also in the wrong ratio compared to when those bacteria in different ratio.

And these metabolites sometimes can be a problem. And these metabolites literally can crawl up through the interior nervous system, through the vagus nerve, up to the brain.

And if this metabolite is a type of metabolite that 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 the gut, in enteric nervous system, crawl up the vagus nerve into the brain and then cause neurodegeneration.

So that's the despite side on the leaky gut side. We know that the intestinal barrier, the site of structure of the intestinal barrier, is very similar to the subtle structure of the blood vessel that supply blood to the brain or called a 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 and actin and occluding.

And turns out in the blood brain barrier, you have the same exact subtle structure in a cloud, in a gluten. So the antibody to those structure in the guts going to circulate in the blood and want to see those same structure in the blood blood brain barrier, it's 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. It's 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 start to trigger this neural inflammatory process, microglial activation and even neuro autoimmunity. And that all spells inflammation, which causes accelerated neurodegeneration.

Yeah, it's all interconnected. And that's why you have brain immune gut and how it's all connected and so, so important that people understand that. Now doctor Kan what are some of the best strategies like what are the 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's maybe 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 where we can start. And oxygen, how can we improve oxygen? Well, that's where exercise comes in, right.

Daily Strategies for Longevity and Brain Health

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 that exercise. We have lows, low intensity, steady state cardio. We have high intensity interval training.

We have resistance training even, you know, flexibility balance training. 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 party of fitness, aerobic fitness, which means they can start with low intensity, steady state aerobics, which means literally going for a brisk walk, maintaining 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 dream.

It doesn't stress out your drawing. So and of course, different people, if you're more in shape, that low intensity may be 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 there's an 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 through muscle you store in there.

So having good muscle mass is important for our quality of life, for activity, daily living, but also in 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 Doctor Jaka has been teaching everybody, which is, you know, using a lower carbohydrate diet.

Right. Not every 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 fat or they just 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 the 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 your 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 is where a roadmap can help.

Now when I say roadmap 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, it may only have a few root causes. So if we can go more upstream then and do it in a specific sequence, it might be easier for people because then 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 the roadmap is address the physiological priorities first. So again that comes down the field delivery. And then the next step I would address is digestion.

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

And then the rest of it detox. Or if you have an underlying infection, it'll be easier to address those things if you got the first three steps arrived because your body is yeah, so key.

And just to tag on with exercise even just just walking just going out for a walk, I mean you stimulate stimulate your lymphatic system. You also help activate BDNF brain derived neurotrophic factor.

Where to Learn More About Dr. Kan's Roadmap

And and especially if you're building muscle, if you're doing some resistance training, you're releasing a lot of myoclonus. And these myoclonus really help upregulate 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 could be doing. So powerful stuff. Well Doctor 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. 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, Doctor Peter Kan.

I have YouTube presence, various social media where there's free videos and they can find information about that. Great. Thanks so much doctor. You're a wealth of knowledge and you always provide great insight and really break down this physiology and the connections between the brain and 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.