Introduction to Trauma, Brain Fog, and Inflammation

Welcome to this interview on the Biology of Trauma Summit 3.0, where we're talking about the trauma disease connection and your path to freedom. Now, in this interview, we're talking about brain fog, decision fatigue, feeling overwhelmed, depressed.

This is all part of the trauma response that the body goes into. And what are causing those specific symptoms? The mechanism is brain inflammation. We talk about this a lot in the biology of trauma models, especially that model where we're talking directly about how to work with your trauma response, your freeze response.

And brain inflammation is key to that. Here is why it is so key, not only, well, the trauma response. So when we get triggered and we go into a trauma response or we have some type of situation that triggers that causes that trauma response, that will cause brain inflammation just simply because of what happens in our biology as a result of the trauma response.

But get this, if you have brain inflammation from other reasons, that will cause a trauma response. This is why it's so important to have this conversation, because you need to know if you have brain inflammation, because if you do, it will be keeping you in a trauma or freeze response.

So let me share with you an assessment that I teach for those professionals who are becoming a biology of trauma professional. After the 21 day journey, we start diving deep into the biology of that trauma response and how to work with their clients.

And so this is an assessment form that I created for them to be able to use for their clients, where it walks them through. These are the events that you're going to be looking for in a person's past, because these are events that will cause that what we call priming of microglia.

You're going to hear about microglia in this interview, but the microglia are immune cells in the brain and they are what unleash this cascade of inflammation and you can have events in your life that predispose that activation so that now it requires less stress to activate primed microglia.

So what will be the initial event that causes that predisposition? These right here, so many people have had direct hit head injuries with or without concussion or indirect head injuries, whiplash.

All of these are things that will cause our brain to be more prone to inflammation from things that are not even emotional triggers. Here would be the symptoms of if you have active brain inflammation, everything from brain fog to just being more sensitive to lights to sound.

Your tolerance for stress is really low. You're irritable because people are bothering you. Everything takes more time. You're finding yourself searching for words.

How the Immune System Shapes Brain Health

All of these are signs that you have active brain inflammation. And again, the connection here that I need you to understand is that if you have brain inflammation that will actually be causing a trauma response in your body.

And if you have a trauma response, it will cause brain inflammation so that when we are working with trauma, when we are working with this freeze response in our body, we have to include brain inflammation not only in the conversation, but in our interventions.

Now to join me for this interview is Dr. Austin Perlmutter. Now, he is someone who is a board certified internal

medicine physician, New York Times, best selling author, published researcher.

And I'm going to share you with you an article that was very profound that he wrote. And we mentioned it in the interview. So I want you to have that resource available for you.

His mission is to help people improve their health by targeting the biological basis of stuckness in our brains and bodies. And where his focus is, is this brain immune pathway and epigenetics.

And so that's what we go over in this interview. Let me share with you the article that I mentioned in this interview, because if you would want to come and read this, this would be fascinating.

Yes. This is a medical literature article published in April 2021 on the immunological interfaces, the COVID 19 pandemic and depression. And again, connecting, connecting the immune system with mental health like depression.

And what what is the actual science behind it? Because once we understand that this is something that's in our biology, this is part of a biology of trauma.

My goodness. It opens up so many more tools for us. So with that, I hope that you enjoy this interview. We're going to get very practical. So let's jump in.

So thank you so much for your work. First of all, on connecting brain health with the immune system. This is, I feel like the untapped area of medicine that needs to be tapped into.

So if you could explain this connection between the immune system, our immune health and brain health. Let's start there. Yeah, well, I'd like to begin by drawing attention to one of the more pervasive myths as it relates to brain health and mental health, which is that somehow what happens in the body doesn't affect what happens in the brain, that we have a mind that exists somewhere off in the ether, and then we have a body that exists here in our biology.

And the truth of the matter is that our brains are biological systems and that mental health issues, just as cognitive health issues, are a reflection of our brain state.

To that end, all of the major systems that exist in our body. So that would be our metabolic health, our endocrine system and our immune system impact our brain health.

And to really drive this point home, 10% of the cells in your brain are immune cells. They are, by definition, immune cells. But beyond that, the majority of the cells in your brain participate in immune conversations.

So neurons have receptors for immune signals. Neurons can produce immune signals and the other glial cells in your brain. So astrocytes and oligodendrocytes are also involved in this immune conversation.

What does that mean for the the average person in the context of brain issues that we might want to talk about? Well, what it means is that your brain is being constantly fine tuned as a reflection of what happens in your environment.

And one of the ways that that happens is through the immune system. So let me give an example that I think most people would be familiar with, which is how we feel when we're sick.

So last time you had a flu, a cold or otherwise, just unwell, how was your thinking? How is your mood? You know, for the average person and I'm including myself in this you feel a little bit off.

You might feel brain fog, you might feel low energy, you might feel like you don't want to go to that birthday celebration. You might feel like you don't want to sit down and do your taxes.

And the reason for this, based on the best understanding of what's happening in our brain, is that it's the immune activation, specifically inflammation, that seems to change the way that we think and feel.

So this is really important because now we've gone from saying, well, the mind exists out here and the body exists down here to saying the brain and the body are integrated by biology.

And one of the ways in which that biology is being changed by our environment, by the things that happen to us as a reflection of our interactions with the world, is through the immune system, for better and for worse.

We talk a lot about the microglia here in the biology of trauma, and we talk a lot about how inflammation in the brain and kind of unleashed by them by the activated microglia are part of the trauma response in the body that leads to the brain fog, the decision fatigue, all of these things that you're mentioning and what you wrote an article two years ago now relating in connecting the the COVID infection with depression.

But it's not just COVID. It really is would be a lot of viral infections. It would be a lot of infections in the body that then would cause this stimulation is activation of the immune system pathway in the brain, is that right?

That's right. And I think another key point that people should understand is that as it relates to how, let's say, inflammation in the brain can be activated.

So you brought up these activated micro glial cells. It's not just through infections, but it may be through infections in some ways. So we had this instance of this COVID 19 pandemic.

Microglia, Neuroplasticity, and Sleep

And, you know, people have a lot of different opinions on exactly what's happening with that, what it does to the body. I think if we can agree that certain people were negatively affected by the virus itself and that many of these people, statistically speaking, have brain issues, many of them now we know long COVID type symptoms, which is brain fog, mental health issues, trouble focusing, trouble concentrating.

You know, one of the core pathways that has been proposed is basically brain inflammatory activation that leads to through what we just described as it relates to kind of what happens when we're sick, a chronic activation of the brain's micro glial cells.

And the output of that is that we don't think as well, we don't feel as well. But the other piece of this which is so important to understand is that brain immune activation could be a convergent pathway, meaning that you can still get brain immune activation even if you're not exposed to something infectious.

And the best example there might be that if you think about what you consume in a given day, that might impact your brain function. There's a lot of people talking about food.

Food is obviously very important, but the majority of the bits of content that go into your brain are coming in through your eyes and through your ears and are activating the stress pathways in the brain which we know well.

Chronic stress within the body is a pro inflammatory signal. So the idea here is if activated microglia, if brain immune activation in general is linked to mental health conditions, is linked to thinking less clearly than we need to worry about, well, what are the things that are activating our brains immune state?

And certainly we can be thinking about a infection. That's kind of the easy answer. Also, we can be thinking about diet, the gut brain connection. That's kind of the next stage as far as making that link.

But we also need to be thinking about the digital content and the conversations that we're having because through again, this chronic stress pathway, this could be also activating those brain immune signals.

So it's basically trying to get to the idea that the immune system is not just an infectious response, but rather is a

signaling system that within our brain is likely one of the principal drivers of how we think and how we feel.

The positive side of this, of course, is that it's not all these negative inputs. There are things that we can do by way of modulating our inputs to potentially improve the health of our brains immune system.

And when this inflammation happens, when this inflammatory pathway get started in the brain, what does that do to neuroplasticity specifically? Yeah, what a good question.

Well, when we think about neuroplasticity, you know, it's it can be described at a number of different levels. Usually what we're talking about is the strength of the connections between neurons, what we call the synapse.

And there's thousands or trillions of these synapses throughout the brain. I was going to say thousands of billions, but that's not quite as helpful. So you have trillions of synapses, kind of the connections between neurons, the connections between neurons and glial cells, connections between glial cells.

And they can be stronger or they can be weaker, meaning that signals can be more likely to go through or less likely to go through. And so the kind of general postulate is neurons that fire together, wired together, meaning that when you activate certain pathways within your brain, it's more likely that they will continue to activate. So what we now understand is that issues with this neuroplasticity are linked to a wide variety of mental health and cognitive health outcomes.

So everything from Alzheimer's disease to depression are linked to issues with neuroplasticity. So we really want to preserve healthy neuroplasticity and at the level of the synapse, one of the things that's really interesting is that certain proteins produce growth factors within the brain, of which the best example is probably brain drive.

Neurotrophic factor seemed to drive a strengthening of neuroplasticity, but by the end of this brain drive Neurotrophic factor appears to be decreased downregulated both from a genetic expression perspective and the actual levels of the protein in the context of both stress and inflammation.

So this is kind of an interesting connection whereby we start to see that the immune system could actually have a kind of suppressive effect on healthy neuroplasticity.

One of the ways this can happen is through inflammatory cytokines. The other area that's important to understand is that micro glial cells, again, the brain's kind of resident immune cells, play a kind of starring role in neuroplasticity that they can actually go and remove the synapses based on some other immune proteins called complement.

But the bottom line here is that inflammation specifically seems to be a damaging chronic effect on healthy neuroplasticity. So it's another reason to really prioritize overall immune health and especially brain immune health as one of the major ways that we may be able to preserve healthy brain function.

So I already want to just jump into it and how do we do that? And what I would say that what we already stress around here is the importance of sleep.

And I would love for you to give us the science behind sleep and this brain immune pathway and neuroplasticity. Yeah, well, it's really interesting when you look at the connection between sleep and brain immunity.

If you look at the research, you know, scientists have been trying to figure out why we sleep for for really hundreds of years, but especially in the last decades and in their search to find out why we sleep, they started looking at proteins in a bunch of animals, like a bunch of random animals.

But what they found is that there was a molecule in the bloodstream that when injected into animals, made them sleepy. And what was it? Well, it was a immune related molecule.

And so that kind of led to where we're at now, which is we actually want a little bit of inflammation to make us sleepy. It may be that one of the reasons sleep originated was to help our bodies respond to perceived damaged

perceived danger in the form of inflammation, which is super interesting.

And it does speak to something else, which is inflammation is not a bad thing. It is actually a necessary thing. We didn't have inflammation. We would die any given day because it's how we're able to fend off the crazy outside world that lives on in us.

So sleep seems to be both something that responds to inflammation and that modulates inflammation. So getting good sleep seems to help keep inflammation and keep immunity in a healthier state, whereas having higher levels of inflammation and being sick may actually increase sleepiness in certain cases.

There's another piece here that I think is important. We're only, you know, more recently starting to understand how significant this is really only discovered about a decade ago.

But it's the idea that the brain has a system that drains out all the metabolic waste that builds up during the day. It's called the lymphatics system.

And the idea here is, which hasn't quite been as vetted in kind of human research yet, that if you have a build up of all of this gunk that kind of accumulates over the course of the day, and sleep cleans out that gunk, which it does, it actually increases the flow of this lymphatics system that not getting good sleep could lead to a kind of blockage of this gunk, which could, in theory, lead to an increased inflammatory response within the brain.

I think the bottom line is sleep is well established to be about the most potent thing that a person can do to improve their brain function on a given day.

And I'll stand by this. You know, food matters, exercise matters. All of these things make a difference. Sleep is the most significant as it relates to seeing changes in brain activation and people objectively being able to say something is different.

So I think sleep is super important for a whole range of reasons. And there's a reason why when we're sick. WORSLEY Beer sleep helps our bodies to recover from an immune threat or just a threat in general.

There's there's some correlates here to say, well, what about people who sleep a lot? They actually may have higher levels of inflammation. And one of the reasons for that may be the driver of why people are sleeping a lot.

So if you're sleeping a lot because you have obstructive sleep apnea and you're not getting good rest or you have another medical condition, these may be things that are independently associated with higher levels of inflammation.

So there's some kind of confounding there. But I do believe that getting good sleep is about the best thing a person can do to optimize their brain in the shortest amount of time.

Diet, Gut-Brain Health, and Practical Changes

Austin Which is why this year I have made sleep be a non-negotiable for me. I like I like it. Because I have come to the same conclusion just based on my personal experience as well, that everything else that I do is awesome and helpful.

But sleep is the biggest game changer for me, for my brain health. And so for this year, it's my non-negotiable. That's fantastic. Now, before we go on to the others, as you're talking about the metabolic waste that accumulates, it makes me think of epigenetics and how that can then start to actually change our DNA as waste starts to accumulate, even in our nucleus.

Can you bring in the epigenetics to this brain inflammation pathway quickly? Okay. Yeah. So I think as it relates to epigenetics on the whole and I mean, I guess you probably go into the basics of this in other conversations, you know, the question is how does epigenetics specifically relate to our brain function and where?

I've been focusing my attention recently is the question of how is it that certain experiences leave such significant marks on our psychological state that can last for decades, potentially the rest of our lives?

Because if you try to understand what processes within our brains could sustain that level of change, it pretty quickly narrows down to just a couple of things.

So it's one thing to say, Oh, you have some inflammation in your brain and the inflammation is making you feel funky, making you feel withdrawn. But unless that inflammation is sustained for years, you don't really have a good explanation as to why you maintain that level of mood, maintain that level of kind of feeling withdrawn.

So epigenetics provides one potential solution as to why certain events in our lives carry forward this psychological state that seems to last beyond, way beyond when the actual event is over.

The other way in which I'm looking at this is actually a little bit of a pivot here, but I might go there in trying to understand how certain therapeutics may have a positive effect on brain function.

And specifically, I'm working with a group to look at how this may apply to psychedelic molecules. The reason they're being if you look at some of these studies, for example, looking at psilocybin where one dose lasted people for multiple years as far as remission from mental health issues and providing kind of benefits to their mental state, it doesn't necessarily seem that either a a little neuro plastic boost because we can look at the duration of some of those effects with those molecules or an immune change or even alterations to the axis could sustain that level of kind of benefit.

So it all leads us to this question of what is happening, happening potentially epigenetically as it relates to rDNA expression and within the brain's, I think where we're where there's some kind of preclinical, very preclinical research is to understand how epigenetic may specifically happen within immune cells as a reflection of what happens in our environment.

So if you look at certain nutrients, there's some signal that, you know, for example, polyphenols, which are a dietary nutrient found in plants, may have epigenetic impacts or actually doing that research right now with a group I'm with called Big, Bold Health. But really where I go right now is, yes, there's some cell research suggesting that there are these interactions between these different systems, between our life experiences and epigenetics and the brain.

But it's still more interesting to consider this question of we don't quite know why certain things that happen in our lives can last so long from a psychological from a cognitive perspective.

And epigenetics to me provides kind of the most the best overall answer to that question and make sure that that is the case. No, I'm not. But it does seem like the mechanisms fit with the timeline that we're seeing.

And I think it's exciting that the research seems to be getting closer to actually establishing the mechanism that is that is research based, that is science, not just, well, you know, trauma causes psychological effects and they just stick with you forever, but actually understand the mechanism, I think that we're getting so much closer to understanding that from a science perspective, which is really exciting.

Absolutely. And there's something incredibly empowering about the idea that how we feel these these kind of deep scars in our psyche may actually be a representation of whatever you want to call it, acetylation, methylation.

But the point being, there's a biological correlate there that can be targeted through as an intervention that we could say we're kind of going to go do some microsurgery on your epigenetic state and, you know, remove some of these methyl or acetylation groups.

And in doing so, the more important thing there is, you know, who cares about carbons. What people care about is how they feel. And if this is the pathway to getting that to a better place, then it's a no brainer that we should be targeting it. Mm.

It is empowering to have more and more tools. So let's talk about two more things. Let's talk about diet and then let's talk about nature. And so what are I mean, let's just talk about the role of diet on the brain inflammation pathway.

I know that's a huge topic. Huge topic. Yeah. If if you think about in a given day, what are the decisions that a person would make that would impact their overall physiology?

Are there really only a few things? And as it relates to physically changing their architecture, it's diet because the molecules that make up your brain don't just come out of thin air.

They are basically synthesized through what you consume, through your food. I mean, that means that you are building your brain with the food that you consume.

So obviously you want quality building blocks. If you want a quality brain, your neurotransmitters are either synthesized or kind of created from certain molecules that come through your diet.

The impact of diet on neuroplasticity by way of things like inflammation is pretty well established. So diet matters mechanistically for all the reasons that one would expect.

There's basically no pathway in the brain that wouldn't be altered again mechanistically by the food we eat. And I alluded to this earlier, but this kind of gut brain connection whereby the state of our our gut, so that includes our gut cells are gut immune cells.

Our microbiome is impacting our brain by way of things like the vagus nerve and also by way of things like short chain fatty acids, which are metabolic byproducts of gut bacteria, all of which can so that short chain fatty acids and immune cells can produce molecules that go into the bloodstream, impact the brain and so on and so forth.

So hopefully that's enough to get people at least interested. If you look at kind of population based epidemiological research, you see that people who eat certain types of diet tend to have better mental health, better cognitive health, live longer, have lower levels of inflammation.

So all of these things are at another level good reason to choose, I would argue, a healthier diet. And then there's some data coming out as far as interventional studies for certain types of diet and certain brain states.

I will say I will just kind of caution that there is a tendency to overblow the level of kind of interventional research in nutrition as it relates to brain health.

I mean, I think there's a feeling that you can cure any brain disorder by making changes to your diet. And while that may be the case for certain people, we just don't have enough research to say that for the average person getting on this really, really specific diet is known to lead to a certain output.

And example here would be something like, oh, get on the ketogenic diet and it's going to fix depression. Or maybe. But do we have that as far as good research and randomized trials?

Not really. So from my perspective, I would say that most dietary advice that people will read about tends to be sensationalized and really not all that helpful because it's usually tethered to trying to sell something.

The best research that I have seen is that for most people as it relates to brain health outcomes and specifically I'm talking about where I've seen the best research around depression, around cognitive health, it's a little bit different around things like stroke and other brain conditions is basically avoiding ultra processed foods and eating a diversity of whole foods.

A lot of plant foods, some whole grains, more poultry, more fish and less red meat. Now, you could argue the details of it, the nuance of it. Do I think that a grass fed or pastured cow is different from a feedlot cow?

I really do. But as you're looking at the general recommendations, as far as what has been shown in an interventional study or in population based studies, it's that avoiding ultra processed food is a good plan, which means cutting out added sugar, cutting out things in your diet that you don't know what they are because they're on the ingredient list and you don't know the chemical structure of Tetro Benzoate or whatever else is in there and it's eating a diversity of kind of whole foods, which includes plants, can include animal proteins.

If you are eating animal products.

Nature Exposure and Closing Takeaways

And I will just say if you're not, there's decent evidence that if you are a vegan, you should look at at least supplementing with Omega three is B12 and potentially some additional elements.

But that's that's my high level diet. So I'd say diet matters from a mechanistic perspective, diet matters from an epidemiological perspective, and now diet matters from an interventional perspective for these conditions.

So we need to be paying attention to it, but instead of going directly to well, it has to be this extreme, you know, diet I saw on social media, which is a 20 day juice cleanse for brain health, stick to the basics because that's where the evidence tends to be strongest.

And also try not to get sucked into the sensationalism and diet wars that are everywhere right now. So that's the diet piece. Thank you for that. And this is so true because for those people who are dealing with how trauma has changed their biology, they're also dealing with mitochondrial issues.

They're also dealing with detoxification issues. And so changing their diet in an extreme way can also trigger a lot of other things and cause some serious imbalances in their in their body biology is that they're just not ready to support some of the more aggressive dietary interventions.

And so just approaching it with wisdom is very much aligned with with what we would like people to do. Well, let me just say one other thing about that, because I think there's there's the obvious truth is that everyone's biology is different.

Some people do need more aggressive dietary change. You know, some people may benefit from a ketogenic diet. But the problem is these things are put forth as blanket statements, which is that everyone needs this.

And when you ask, well, what's your research to support this, it's usually, well, a cell study or an observational trial with ten people. And the the issue here is that when you look at statistically what happens to people who are trying to make lifestyle changes, and the best example here is the New Year's resolution.

It's that people tend to believe that the only thing they need is a plan and willpower and they will be able to follow through with this thing. So whether it's the Atkins Paleo, keto, whatever choose your poison diet, it is the more extreme the diet, the less likely you'll be able to stick to it.

Same with an exercise routine. If you have a5ka day goal and you've never run before January 1st, the chances you stick to that are almost zero. So I am all about habit change and sustainability, which means that you don't have to change everything at once.

And as you're trying to make these changes for your diet, celebrate the little things and start small. Where I usually tell people to start is try to reduce added sugar.

It's pretty much universal that especially in sugary sweetened beverages, whether you're a conventional doctor, an integrative doctor, the World Health Organization, the CDC, everyone recommends to decrease intake of added sugar.

That is not sensation realized and it's also not controversial. And yet the default is for the average American 50

plus pounds of added sugar a year. So there's a huge opportunity for positive change that can be very specific and can be very implemented in a given day.

I love that. A great place to start. Start cutting out the sugar, sleep more and then let's talk about nature. Let's do it. Yeah, I'm super curious, but also like I've already seen this effect so much in the people who come to my program that they talk about how much more focused and calm they are when they get time in nature.

So what's the science behind it? Austin Right. Well, when I think about the best interventions for human health and specifically for cognitive and mental health, I like to think about where does the research show a statistically significant benefit and what are things that are accessible to the average person?

So, you know, maybe cryotherapy is beneficial, but who can afford a cryo chamber in their living room? So nature exposure turns out to have some good research to support it and it tends to be readily accessible and often free.

So what does the literature say about this? You know, in the United States, we've started to investigate the impact of nature exposure on our overall health.

But in Japan, they've been looking at this for multiple decades. It is called their children Yoku, which is basically the science of forest bathing. The idea here being that just being out in nature, not having an agenda, you don't have to sit and meditate for 30 minutes under a tree.

Just being out in nature, being mindful in nature has health benefits. And one of the most consistent signals that's been seen from this type of research, which is basically having people go and be in nature as opposed to in kind of urban environments is a decrease in stress markers.

So both subjective stress and physiological markers of stress like cortisol. And one study that I like to cite was a U. S. study done in Ann Arbor, Michigan, where they had people go and basically be in urban natural settings.

So we're not talking Yosemite. We're talking just kind of a city park for 20 minutes. And they found it was enough to lower people's salivary cortisol.

And so that was once a week an intervention that was statistically shown to benefit people's stress markers. And you see this kind of more generally with a bunch of other correlates of stress.

So, for example, lower systolic blood pressure, for example, better heart rate variability, as well as people experiencing kind of subjective benefits to their mental health when they're in nature.

So there's lots of other research we could talk about. There's brain imaging studies, there is research on rumination. There's research on kind of overall quality of life.

But the bottom line I would put forth to people is, as you're looking at things that you can easily incorporate into a given day, getting a dose of vitamin and seems to be the no brainer here.

And yes, I do understand that there are places that going outside is not super practical for certain seasons. And to that end, I would say there is some research suggesting you benefit from indoor plants.

And so starting with just getting an indoor plant or two, you know, there's there's also some, you know, something to say about caring for something even as small as a plant.

But having an indoor plant may may give some of those benefits because, you know, in some research or they're actually shown that looking at digital pictures of nature composed compared to digital pictures of cityscapes is linked to better brain outputs.

In this case that I'm describing, people made more future oriented decisions when they looked at nature scapes versus cityscapes. So having a plant in your home is a another cost effective way.

Specifically, if you get a snake plant, which is kind of my go to recommendation because I am not I don't have the best green thumb. So it's a little disheartening when your plants pass away early.

So snake plants are very resilient. It's a nice way to bring some green into your home. I love it. And so in summary, for people, we've got sleep, we've got diet, we've got nature as tools that they can use that are accessible for everyone in order to help improve their brain inflammation, pathway and healthy neuroplasticity.

If they could only change one, we would bring in the sleep first. If we could only change one thing about the diet, we would start with cutting out the sugar with the nature.

These get a snake plant in your home but even go don't. Have a stock in snake plants. Just even just going to a city park once a week. Exactly. Would be would be good enough so that I get the order right of how you would prioritize this for people.

That's it. Yeah. I love it. Mm hmm. All right. Thank you so much. What a powerful interview. So we can all start with getting more sleep. We have other talks on this summit about sleep.

We also have more talks on this summit on epigenetics. So Dr. William Walsh, Dr. Bruce Lipton, those are some of our epigenetic experts. And epigenetics plays a big role in the trauma response in that biology.

And so we have different tools that we have to actually address epigenetics and specifically the oxidative stress that causes these epigenetic changes.

So again, love on your body, love on your your oxidative stress system and being able to clear that stuff out and look at ways that you could just bring into your every day in order to clear out oxidative stress.

Now, in this interview, we definitely covered a lot everything from my goodness of sleep, the diet, the nature, but even all of this science. And I do know that this is a lot.

So if you would like to resource yourself by the package, by all of these interviews and the recordings that you have access to them ongoing, and you can come back at any time and listen to them, because I want you to have all the information and tools that you need moving forward.

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I'm Dr. Aimie, your host for this summit on the Trauma Disease Connection and I will see you at the next interview.