Introduction and Guest Welcome

I'm your host, Dr. Ken Sharlin. And today, I'm very excited to have Dr. David Haase. Dr. Haase hails from the great state of Tennessee, where he has, pioneered the Maxwell Clinic.

Dr. Haase wears many hats. I've known him as one of the finest instructors I have ever had the chance to, learn from through the Institute for Functional Medicine and does excellent work as a consultant to, other medical and biotech companies.

But I'm gonna save more of that bio because I know it's going to find its way into our discussion. I would say, doctor Hassey, is definitely a science and tech geek as great as they come, because you're going to hear about a lot of cool, cutting edge things that he's up to.

So we're going to call this interview Advanced Diagnostic and Therapeutic Strategies. And he is going to blow your mind. So Dr. Haase, welcome to the Parkinson's Solutions Summit 2.0.

Oh thank you, Dr. Sharlin, it's great to be with you. Thanks for doing such a great job pulling people together here. Absolutely. And you're I brought you back for the second year of the Parkinson summit.

We had a fantastic discussion about therapeutic plasma exchange. and there going to be a lot of new folks here, a lot of folks who just want a refresher.

So maybe we can start out with that. But I know there's some other areas that we want to get into, some really exciting emerging science and diagnostics that maybe are, we're still even in a solid footing in terms of thinking about all the incredible uses that this technology brings may bring with it.

And I think folks can be very, very interested in hearing about this. So let's talk about therapeutic plasma exchange and hope and what it is and how it can help people.

That sounds awesome. Sure. well, plasma exchange is a very interesting technology now. all of us medical doctors have been exposed to it. It is the standard of care for very severe autoimmune disease.

Therapeutic Plasma Exchange Basics

And I'm a I'm a qualified specialist and a physicist and, very interested in this process by which you take blood out of the body, do something to it, and then put it back in the body.

So what plasmapheresis or plasma exchange is, is, putting an IV in one arm, and, it's removing the liquid part of the blood, which is the plasma from the cells.

And then, replacing that with a clean plasma replacement fluid such as albumin. And then that all goes back in the body, and we have an individual sitting in a chair beside a very, quietly, very technical machine.

It takes a couple hours. But by the way, when you're done with that, we have removed the equivalent of all the plasma that you started with, in the body.

And this is really important, because, a big that happened in my life as a medical doctor, happened because of this plasma exchange. I was I was going like that.

I know, and I need to rewind a little bit before I say just why this plasma exchange is so powerful for Alzheimer's disease and Parkinson's. But what really the interesting thing is that we know that this plasma exchange and some

of the research that we've done looking at longevity, actually helps the stem cells that live all over the body to actually behave younger.

And the sense of stem cells are what create healing. if you change the environment of the cells, what we call the habitat, then the cells start behaving according to their habitat.

And this was a big for me, that no matter what cells you have in your body for healing, wherever they are, they are dependent upon their cellular habitat and the habitat or the cell.

You think of a bird. Whether habitat's a tree in the outside, in the air. the habitat for a cell is what we call the extracellular fluid. This is this, you know, pond that hangs around all your cells, that all of your nutrients have to go through.

All your oxygen has to go through your carbon dioxide, your waste. And and that's the interface, between your cells and the outside world and the part of this hab cellular habitat that lives inside your blood vessels.

We call that plasma. So your plasma is this liquid extracellular fluid that happens to be all inside your blood vessels. And just like you are, your health is greatly dependent upon the health of your habitat, the air you breathe, the food you eat, you know, the people that you're around, even the habitat of your thoughts and your ideas about your illness.

Right? That's your habitat and that shapes your health. Same way with the cell. If the habitat is dirty or, you know, or dirty or, cluttered, if it has molecules of that turn on inflammatory pathways, if it has molecules in there that turn on senescence, if it has all kinds of nasty molecular signals hanging out in this habitat, the cells are going to live in accord with how healthy that habitat is.

So the remarkable thing about plasma exchange is that we can optimize the cellular habitat. We can remove the plasma that is in the body and then, adding in clean plasma, clean plasma replacement fluids, and then that extra cellular fluid that's hanging out inside your blood vessels kind of migrates into around your cells and the dirty stuff that's hanging out around your cells migrates back into the blood vessel.

And then if we do another plasma exchange, we now clean the intravascular habitat. And then that can equilibrate with the cells that are in the body or extracellular fluid.

And again, and the habitat gets cleaner and cleaner. And what's been amazing. I'm giving a talk for the Canadian Association of a Physicist Physicians in October.

And I'm going to talk about, how we've ignored this study called Anbar. And Anbar is a really remarkable study that looked at using this plasma exchange for the treatment of Alzheimer's disease.

And it turns out that and there's been a lot of subsequent observational data. But in individuals that have Alzheimer's disease, you know, in a center in Spain that's been doing thousands of these, turns out that 70% of those people will have a halting of their progression.

That's an amazing number. And, that is supported by the Anbar trial, which stated about the average person has about 61% less progression over 14 months.

So, plasma exchange has great utility, I believe, and we've been able to see it in the clinic as we do plasma exchange for people with cognitive decline and Alzheimer's disease.

But the question is, can it help Parkinson's disease? And interestingly enough, my first patient ever in my clinic, a longtime patient of mine who was a cheerleader for me, learning all of this stuff about A36, was a Parkinson's patients.

And we brought him in. He did a plasma exchange. And, he the next day he started to, play the piano again. He

went out and started a garden, which he hadn't done three years.

He took his wife on a date and he went back. And that week he went back and took over as chairman of the board of his company that he had been pulled away from for three years.

It was a ridiculous transformation, which I think it had a lot more to do with hyper coagulate ability, you know, and I think he actually had better brain perfusion.

But, I'm very fascinated with plasma exchange in the treatment of Parkinson's disease.

Mouse Parabiosis and Rejuvenation Research

And I'll, I'll tell you a little bit more about some diagnostics and why I think this has special applicability to people who have had Covid and, and where that goes from there.

But that was kind of a, whole lot of information really fast. but that's the the Redux on habitat, optimizing plasma exchange, for the approaching, neurodegenerative disease.

You know, I'm sure this happens to a lot. It certainly does in my clinic, where, preliminary data, things are done, lab mouse mice, experiments, maybe, very early phase trials.

Someone reads about that. And then the question is, well, should we be doing this in the more broad clinical scenario of treating and is treating Parkinson's and so forth, and of course, the best standard acceptable answer is we need evidence, we need to do the big trials and all that.

why I'm saying this is, I know we've talked about this before, but I still find it fascinating, even though you're talking that humans might quickly go back to that.

I think the those early experiments of sewing the mice together, if folks who are watching this haven't heard this, I mean, this is, what doctor has he talked about?

I want to tell you, has this science has really evolved. So he's at the cutting edge of it. But but sometimes it's important to remind folks that there is a history here.

There's a back story. Right. And that backstory has been around for a little while. It's just how do we take that information and and make it clinically useful?

but I wonder if you just take a minute and talk about two mice being sewn together. I think it's an incredibly interesting story. So actually it starts before the mice.

It actually starts with humans, interestingly enough, because what was noted by physicians like myself that are experts in a crisis when they would do a plasma exchange on patients, sometimes we don't for an autoimmune disease, sometimes other conditions would get better, but sometimes they got better from things that they weren't treating.

And this is really been one of the big mysteries of a physicist. Why does some people have side benefits from this procedure? So that was a that's that's an very interesting thing that happened long ago when plasma exchange first started for patients.

But what was a very interesting set of experiments, done by Arena Conboy at the University of Berkeley and then replicated at Stanford and MIT and Harvard, there's no question that this is real.

do you take cloned mice, an old mouse and a young mouse, and you actually sew them together on by their side? Now, the poor little guys are now attached to each other as they run around the cage, and they share a micro circulation.

So because they're clones of each other, they have the same immune system and everything like that. They can do that. There's no rejection going on. But what happens is a really interesting thing.

That old mouse within about seven days starts to turn young. the, the immune system reverts back to a younger expression. The, liver fatty liver disease reverses the osteoporosis that comes with age in mice, reverses the hair, and, hair starts to be thicker.

If the muscle is damaged, it heals faster and it's able to. The mice are able to become more muscular. the sense of smell of these mice returns. And in cognitive tests of memory of the old mouse, they improved their memory.

So this was like, how on earth and who the to understand this, it really does go back to understanding habitat. That old mouse, all their stem cells, all those cells that are scattered throughout the body that have the job of repair in a person.

They, first of all, they go down drastically in number as we age. So the older we are, the fewer those stem cells are hanging out in our tissue, ready to do the job of repair.

But secondly, as we age, we also get metabolic clutter. We get molecular sewage building up. And that then creates a negative habitat for the stem cells, the old stem cells that are in the old mouse.

But if you instead then make create a young environment for those stem cells, they start behaving young and start doing the job of repair again. And so that was a really remarkable.

And then they went back and they said, well, is it all a lot of good things that are in the mouse, the young mouse plasma that are doing this. So they decided just to use this clean replacement fluid that we use.

And sure enough, much of the same effect happened. If you do a plasma exchange on a mouse and just take out the old plasma and put in, albumin replacement fluid, there are some other benefits that definitely do happen from the exposure to compounds that are in like a young mouse.

So when we do plasma exchange, oftentimes there are opportunities for people to, add in things that may be supportive of healing as well. So, yeah, I that the, the whole science is very clear that this has to do with the in many ways, the resuscitation of body wide tissue based stem cells so that they do the job of healing.

And, it's really just so and I think what's so beautiful about this, and if even if you, you or your family member don't have access to a clinician who can provide plasma exchange, one of the most beautiful things about this is it's proving everything we're talking about in functional medicine and systems medicine and lifestyle medicine that the quality of your life, habitat has a huge part to play on the quality of your body's ability to self-heal.

And we're designed to heal this, this, this has given me even more confidence and, authority, really, in talking about all of those lifestyle factors that we do have under our influence so that we can change our genetic expression.

So when we do plasma exchange, we're doing that just kind of a book, you know, all in a fell swoop, kind of like a snowblower clearing a driveway. but as but as we deal with our lifestyle stuff, that's actually slowing the snow storm and, and that's what we want to do.

But. And I'm so glad you're saying this because, you know, I, you and I both utilize supplements. In fact, if you still are. But your chief, I think medical officer advisor for time again, which, by the way, folks, very big supplement company, very fine supplement company.

My plan is that there's no issues with supplements and they can be extremely useful as a tool in the toolbox. But it also tells us that if we're going to take this approach, then we're not going to fix the problem just by giving people a handful of supplements. They don't.

And that's why in my approach, you know, when I meet with people, a very kind of walls approach with Dutch walls.

I work very much together. But we have to start with the foundation.

We have to. The first medical history is tell me about your sleep. Tell me about you know what, what you need over the last couple days. You know, are you pooping and peeing?

Are you drinking water? You know, telling you that your your exercise, the exercise at all. So what do you do?

Lifestyle, Supplements, and Cellular Habitat

I mean, that is we get all of those questions answered right from the front end. And I know that folks really love the testing and everything we do. And I'm sure that's the case in your clinic.

And they're very anxious to get to that. Like that start line. What am my test results? Right. But we're going to spend a month before we even talk about test results, dialing in the foundation, or at least raising an awareness of how important this foundation is.

Even if we continue to evolve it and improve it and dial it in over several months, because there's nothing that you can take that's going to that's going to overcome those kinds of hurdles if they exist.

But what's very interesting that you're saying is that in some ways, well, maybe there is, but it's a very holistic and that is replacing the environment altogether.

Right. You still got to do the work. You still have to do the work. Right. and I'm no longer, have that position, as I imagine the great companies still use their stuff.

and I think I always want to say, remember, supplements are supplemental. They are supplemental. They're not meant to lead the way. And and that is. And in understanding why you're taking what you're taking, they can be incredibly powerful and helpful and useful.

you know, I'm really interested in a new molecule, the one that's more commonly understood right now called urolift. And a and it turns out that it's activating park and parking, you know, so it says it's helping this mitochondrial by a mitochondrial or mitotic ology and a substantial level.

So I'm very interested in that in this whole discussion about Parkinson's and why. And you have that compound naturally in the diet only comes up when people have a certain microbiome and they eat a certain food together.

And not everybody, even in some people, eating the right food, don't make this molecule because they need the combination of the right food and the right organisms.

And God, we're complex. It's beautiful. but, yeah, we're never going to run out of things to learn, that's for certain. I'm glad you brought this up. So let's segue into the mitochondria and something that you lecture about, of course.

And then how that relates to Parkinson's and this, test. So you can educate me as well as the viewers on the, the me or my screen mitochondrial test. Yeah. Great.

You know, one of the big challenges, you know, and I've been the lead faculty at the Institute for Functional Medicine bioenergetics module, for ten years now.

And I'm the guy who teaches, the fundamentals of mitochondria. And I love that, mitochondria, which are the powerhouse of the cell. I like that it has become a mean meme.

I think that it's so important because every cell requires energy to do what that cell does. And the mitochondria is that powerhouse that enables every cell to do its job.

And the mitochondria are like a big lava lamp. Frankly, I like there's this joke that you know how many mitochondria

are in a cell, while the correct answer is one, right.

Because it's just a big lava lamp that's kind of blabbing together. It's it's coming together and fusion and coming apart in fusion. And it's, it's in it's always in movement.

And this structure of the mitochondrial network is, is showing more and more importance how the, the, the shape of the in the intracellular mitochondria have a lot to do with how they function.

And mitochondria, you know, you can imagine these are like in many ways it's kind of like the coal burning plants of the body. You know, they're bringing in hydrocarbons mixing up with oxygen to make energy.

And you get carbon dioxide that comes out, but you also get certain smoke that come out and that's soot and smoke. We call those oxidative molecules or oxidative radicals that cause oxidative stress.

And you know, yeah, this is a this is kind of a dirty place in the mitochondria if you think about it. And so there's lots of this smoke and soot damages the molecules inside the mitochondria on a regular basis.

So the mitochondria has to continue to kind of clean it out, clean itself out. So the engine is running clean. And one of the ways the engine runs clean is through this process of of my autophagy or mitosis. So, what we want to do, it is if you have a mitochondria, all the damaged parts are kind of herded over to one end of the mitochondria, and a pinching action is begun by some of the molecules, and it pinches off the damaged part of the mitochondria.

Mitochondria Testing and Parkinson's Biomarkers

And then that damaged part goes and gets digested. Well, it's interesting. So many of the conditions that are associated Parkinson's have are associated with this pinching off action.

that might haffajee, which literally means eating the, the or the eating the mitochondria. And and so I've been very, very interested lately in this one molecule, you're your lithium a which has a potential to upregulate, park and some of these genes that induce my top AG.

So, and I, I think it's too early to make any conclusions about these compounds preventing disease, but, I do think that they can be quite helpful. But the challenges in measuring mitochondrial function, because, the way you measure your mitochondria, officially, is you go to a lab, you have a muscle biopsy done at the lab, usually not using anesthetic, and they take a chunk of muscle and they run it across the hallway, and they put it into a device called a seahorse.

And the seahorse, starts to analyze it from a metabolic standpoint. it will say how much ATP is generated, which is the energy molecule, how much oxygen is being consumed, how much lactate is building up, which is, you know, another kind of way of making energy.

and then you can also measure these mitochondrial structural networks. You can measure how many reactive oxygen species are coming out. And that's a very difficult, painful test.

And it's available very few places. But that actually gives you a measurement of the function of a test, a function of the mitochondria. Excuse me. Well, in came the, NASA.

So so many innovations happen when we send people into space. So they did a split twin experiment where they sent an identical twin into space and had an identical twin on the ground for a year.

And they were tracking all kinds of biometric. Well, they couldn't do repeat muscle biopsies up in space. So they said, well, we're going to have to find a surrogate way.

So they developed this new blood spot card that would separate out the red cells from the plasma. It's a very specialized blood spot card. And they stored plasma and they stored cells.

And they did this both on ground and in the in the space station. And then they went came back and they looked at, the difference between what happened with the astronaut that stayed on Earth and astronaut that was in the International Space Station for a year.

And turned out that shifts in mitochondrial function as measured by this platform, or one of the biggest changes that were understood it. So this change is basically using plasma to create what we call an imputed result, to create the habitat in a standardized cell line inside a seahorse machine.

And then what that that environment then shapes how those cells are going to behave. And we start measuring mitochondrial behavior as a result of the habitat.

So I really think this is in many ways a great test because it's it's giving a clear understanding of the messaging environment and the intracellular habitat or the cellular habitat that is shaping mitochondrial function.

It doesn't necessarily measure the genetic abnormalities of the mitochondria like electron transport chain. Uniqueness is for that. I think our best. Yeah.

There's another test called Midas swab, which is can be somewhat useful but challenging to interpret as well. But this test called the me screen like mitochondrial efficiency screen, looks at multiple different parameters of mitochondrial function.

that can be tracked and it's great. It's use a blood cut blood spot card. And interestingly enough, so it's highly accessible and, I really think that, and it does take some challenge in interpretation of this, and it's not it is not a a simple yes no type of, data that comes out, but it gives me great hope that we are getting to take a look at true, a true functional test.

You know, we're looking at, you know, we're we're, giving a cells an environment and we're seeing how they respond. From my mitochondrial standpoint, I think that's pretty exciting.

So, you know, we're really at a pivotal time with Parkinson's disease, you know, as we speak, there's been, proposals about a new staging system largely based on measuring alpha synuclein in the spinal fluid using something called a seed assay or seed technology.

So even a couple papers that came out recently proposing that we completely, ditch the term Parkinson's disease and, and refer to these disorders as, I think neuronal alpha synuclein apathy or something along those lines.

but we're trying to navigate this and, you know, for watching this is super important to Parkinson's because, kind of like doctor, as he was talking about the therapeutic plasma exchange and how sometimes we stumble on these observations, and we pay attention, these things that happen sort of serendipitously, are telling us something and we latch on to it, investigate it, then it can grow into something much more significant.

So in this story about Parkinson's, we have the infamous MTP. cases it came out of, I think Los Angeles, California, I think was the 70s. William Langston, the, neurologist who probably was just a medical student or a resident at the time, but these, drug addicts were showing up in the emergency room and in big clusters.

It was all like, five cases all at once. The same thing, with acute Parkinson's disease. And they had inadvertently injected themselves with. They mitochondrial poison.

Now, they didn't at the time. No one knew what that was. I mean, there was obviously an epidemiological investigation into that. And it turned it out, turned out that some street heroin had been tainted with this toxin.

but what happened as a result? First of all, and by the way, you can go on to YouTube and type TP Parkinson's Lancet, Lancet, because it was published in The Lancet, but actually watch the videos that were, because it was in print, but then they were, additional videos you could watch the that went hand in hand with the articles, but, these guys were given leave a dopa, and they got remarkably better.

So there was this moment that this isn't exactly Parkinson's, but it probably has something to do with Parkinson's or it's related. And that led to an understanding that MPP was a mitochondrial toxin and how we could better understand, you know, Parkinson's disease by recreating these in this in the laboratory.

And people like Marlon DeLong, who recently passed away. But DeLong and his team from the Parkinson, then Emory really mapped a lot of this out and figured it out.

And they their migration from Hopkins to Emory was because Emory had at the time the Yerkes Primate Research Center. So they were they were producing, you know, monkeys and studying them.

And then, you know, killing them. And so looking at their brains under the microscope, then leading to things like deep brain stimulation, but so important to understand that these mitochondria, you know, respond, guess what to their environment and that when you damage the mitochondria, that leads to a chain of events that we recognize as Parkinson's disease.

makes me do that with this emerging test because there's a, you know, we don't yet, in the traditional pharmacological sense, have disease modifying therapy for Parkinson's, like we now have two officially approved drugs for Alzheimer's.

but we're close. We're getting closer. And I think that's why there's so much interest in creating these staging systems. Because we have to know is our therapeutic intervention actually doing something in the biomarkers?

And basically what you're saying is this could be a biomarker. Yeah. I think what's really interesting, and we're going to see a lot of the the interactions with like this synuclein with the mitochondria themselves, because mitochondria are a very much like a bacteria that lives inside our cells.

It has much of those factors. I'm I'm really fascinated with the infectious side of Parkinson's as well. I mean, there's like that data you're showing the animal models of that.

It turns out doxycycline is somewhat protective against that toxic cycle and actually like inhibits, the aggregation of alpha synuclein in some of its more, damaging areas.

But anyway, I just think when we, you know, I know this is the Parkinson's Summit, but we have to be really careful. Don't buy into the to label Parkinson's too easily because, you know, Parkinson's is the end state of a whole bunch of other things that came together in a very unique human.

It's way more important to understand the person that has the disease than the disease the person has. And that's from Sir William Osler, one of our, you know, the luminaries of modern medicine.

And we can't forget that. So it's the diagnosis of Parkinson's or pre park and should just be the beginning of your understanding. I love diagnosis actually means Gaia is through and gnosis is to know.

And so a diagnosis means to know through and through. It's not. And naming and blaming it should be a an invitation into understanding. And as we understand now, we can start saying, hey, what are all the multiple multifactorial factors that are, perpetuating this process?

Is there something we can do about it? You know, there's another test that I'd like to tell you about. that has a lot to do with this infectious side in a totally different way than most people have thought about it.

And, media, can I talk about that for a second?

New Genetic and Infectious Disease Signatures

Yeah. Please. Let's. That's great. Yeah. So. So, this is this has to do with a mystery that's been going on for a long time, because you hear people getting a whole genome analysis done.

Do you know there's chunks of that whole genome that never get analyzed? Never get sequenced? There's big chunks of it, and they just get passed over because they're so highly variable.

Now we have these highly variable regions. One on one region is in this area where we make our B cells and the other where we make our T cells. And this is how the body is able to do all this.

Cool rearranging so that you're kind of ready for anything as you come out of the womb. Really, our immune systems are really miraculous, and they have a lot to do with these highly variable regions.

But there are monstrous chunks of nuclear DNA that are also highly variable, and they've just kind of been like passed over. Oh, that's junk DNA. How many times have we done that?

How many times have we just because we don't understand something like, well, it must not be important. So, these turn out to be really important and and what, Doctor Howard ern of.

It's a brilliant researcher I think should get the Nobel Prize for this work. has discovered endogenous ancestral nucleotide sequences. That's a big word for, like, ancient viral particles.

Turns out that these these highly variable regions have to do with the different chunks of viruses and other pieces of DNA that we have accumulated in our ancestry.

So from one person to the next, different people groups will have certain types of these endogenous ancestral nucleotide sequences. And you go like, well, who cares?

Well, this is why you should care because, we really think that this is in some ways like the operating system for the, for the DNA. So, you know, we know that our environment causes a lot of changes in the expression of which genes get turned on.

But and we know there's lots of intermediate steps, like if you get, you eat, sulforaphane, which is a, a compound in broccoli that will turn on the production of the inter F2 gene cassette.

And then you're going to get a deer. Genes that are associated with that gene cassette are going to start reproducing and make a bunch of antioxidant enzymes.

And okay, look, environment had a lot to do with, genetic expression. Well, but in many ways, we can't really make the connection between environment and why a certain disease comes up.

It turns out that there's a there are patterns that exist in these highly variable regions that give us the clue as to what and disease, trajectory people are on.

And so this one blood test, the early data, and we are the first center in the United States to be utilizing this. We're then partnering with the university of Iowa, you know, Michigan Vanderbilt's coming on board as well.

this is super exciting technology. This one test, can diagnose individuals with Alzheimer's, Parkinson's, Ms.. Several different forms of cancer and long Covid.

And this is what's really fascinating, because each one of these disease states are associated with a certain genetic expression pattern. Now, the research is the research is early. And, the, in a where participating in that research, and the funding is coming in.

And anyway, it's, it's incredibly exciting. But why I wanted to bring this up is that one of our patients who was actually coming in for plasma exchange, and we are doing a series of these tests before and after plasma exchange to see how quickly do these, chunks of RNA re accumulate in the body after plasma exchange?

We want to know is, are the is this RNA always present or is there are parts of it that are there when we clean out

the system with plasma exchange, how soon does it really cumulate?

What's the pattern like? Lots of really good basic science questions that we're answering here. But what we found is that we found some pre some individuals that grouped with Parkinson's and also grouped with long Covid and and what this is really scary honestly because we have seen a big jump in, early onset Alzheimer's disease.

We've seen a big jump in, cognitive decline since Covid and more severe disease with Covid definitely perpetuates more neurodegeneration, where one of the studies we're running here is the Evan Thea trial, which is a randomized controlled trial looking at our precision medicine approach to reverse cognitive decline.

And and we're having to really pay a lot of attention to just when people get Covid, because we think Covid is a big, another big factor at driving forward neurodegeneration.

So anyway, this test comes from a company called FB bio that's like spread brown, brown, brown. I'll FB bio and, and it's very new. This is not something that, you know, many folks are going to have heard about yet.

but, I think it's one of the most exciting things to help us understand this interface between environment and disease. I think with enough data accumulation, this is going to give us a lot of understanding about what in the environment is driving force.

This particular genetic expression pattern. And so, early is just diagnosing, putting a name on things. But later, especially with good data accumulation, I think this is going to have a big part to play in helping us understand what is most important to address for an individual, and then to clearly be able to track the effectiveness of that therapy, because these markers change with effective therapy.

This is not just a this is, oh, you have this disease or you don't have this disease is instead are you are you on the trajectory of worsening of this disease process early on in the trajectory of improvement of this disease process?

And I find that to be very helpful. It's huge opportunities for me to learn as well as I do all the research and write these talks. And, what really was very clear that if we sort of line up these big diseases miss ALS, Alzheimer's, Parkinson's, Huntington's disease, they all have something in common.

And that is that at least more downstream, the involvement of a pathological protein, a protein that's either been overproduce, misfolded, can't be degraded.

We refer this to this overall as protein apathy. So the amyloid of Alzheimer's, the TDP 43 of ALS, Huntington, huntingtin protein of Huntington's disease.

And even though most people don't think of, Ms. as a protein property, in fact, there's something called the bassoon protein that is part of the story of multiple sclerosis.

So that makes me think there's a connection between what you're saying, because of course, genes, you know, DNA, RNA, protein, that's the that's the progression.

So it makes me think that what we're calling these protein properties, if we dig go more upstream, we're going to see these fingerprints that you're talking about.

I completely agree with you. And these proteins like like an Alzheimer's disease, the amyloid beta proteins, the, the p tau217, the, Alfonse and nuclei and the all of these in many ways have some anti-microbial activity to them.

We think that the a lot of these, amyloid beta apoptosis or tau apoptosis they come into being because the body own naturally produced antibiotics are becoming insufficient.

One of those is ll37 or Ccathelicidin And and that actually has great homology. I mean, it acts the same as, beta amyloid fragments. So I think infectious disease is a huge part of neurodegeneration.

And, and I do think that we're going to continue learning more and more about that. The problem is the insult may be so much earlier than the later damage that we're now dealing with.

whether or not these conditions are persistent or not. we have, a lot of work to do in that domain.

Environment, Self-Care, and Closing Remarks

Or if it's not just the fact that maybe it's just a small amount of infectious process there, but even the memory of that infectious process with an immune system that is now becoming old and untargeted, you now start getting friendly fire from the immune system.

Our Department of Defense going out thinking it's trying to kill something it's supposed to kill, you know, starts creating the the injurious molecules that start damaging our own cells.

But, the great news is I think there's great progress being made on all of these fronts. nobody ever wants a neurodegenerative disease, but there's never been a better time to have one.

Taken solution, a solution, something here. We're talking about a lot of science. And certainly I know folks may want to seek you out for therapeutic plasma shades because you are doing that in your clinic.

some of these other things are more exploratory, investigational, but it's still, you know, the thing that's kind of going through this whole discussion has been environment, environment, environment, environment and work.

And we know that plays a major role in Parkinson's. So if folks are going to do some self-help, some self care as a result of this summit, they want to really put a magnifying glass.

What can I change in my environment? Can I change my food? Can I make sure the air I'm breathing is clean, clean my water and my sweating and my pooping?

And that may seem like an oversimplification, but these things are very powerful, holistic tools that have profound effects, really, beyond what a single drug can do.

Because a single drug targets one thing, right? Food targets many things all at once. well, doctor hat. Go ahead please. Yeah. Oh, no. Just absolutely just couldn't couldn't agree more.

But another interesting part about plasma exchange is I actually think it mimics the physiology of fasting and exercise. because what happens when you're basically kind of running out of energy or running out of resources?

when we do plasma exchange, the body all of a sudden is confronted with this need. It's like, hey, wait a second. A lot of the things that just used to be here aren't here.

And I think it turns on its reparative structures in that way. So we have more to learn about. We're always going to have more to learn. We know enough now to take action.

But, we're always going to be digging into the why behind it to continue to improve. the process. So that has a I'm looking at my notes for our visit today.

And, you've mentioned that you may have an event where at least, you were l or an offer you want to share with folks. you know, just go to, you know what?

I don't know, maybe I do, I think, does it say where I was going to send people? Yes. And it says we will have a PDF for this then, I'm assuming, that maybe you want to share something, but certainly we can direct folks to your, website and to read about, hope the, habitat optimizing plasma exchange.

That's great. You know, sometimes I'm a way better doctor, than I am, you know, promoter in some ways. So. But

come to Maxwellclinic.com. If there's if and, please give our clinic a call, and, we'll do everything possible to, make certain that you get the information that you need. So.

Thank you. I think has been a fantastic interview and, you know, have more and more excellent conversations, but, we'll wrap this one up for today. Really appreciate you being part of the Parkinson's Solution Summit.

Thank you very much, Dr. Sharlin, I appreciate you doing this. Thank you.