It's More Than Mycotoxins

Dr. Eric Gordon, M.D. interviewing Ritchie Shoemaker, M.D.

Dr. Eric Gordon:
Good afternoon. On this exciting day, with another edition of "The Mycotoxins and Chronic Illness Summit." And today I have a real pleasure, a chance to chat with Dr. Ritchie Shoemaker. Dr. Shoemaker has sort of been one of the leading lights in my life, in treating chronic illness. I had a patient come into me in 2001, I believe, clutching a book and with the present of a visual contrast sensitivity chart. And I've been following it admiring and enjoying Dr. Shoemaker's ideas ever since. And I've always been amazed at how much he has to teach us. Today, we're gonna start off with a title that I actually like. It's a radically different view of mycotoxin illness. And so, Dr. Shoemaker.

Dr. Ritchie Shoemaker:
Well, Dr. Gordon, you're looking younger these days.

Dr. Eric Grodon:
COVID. No haircuts and I kept it up.

Dr. Ritchie Shoemaker:
So you asked me to talk and I think we'll have a conversation, not a talk and not a lecture, but there are some advances that have happened in the world of molecular biology that really do impact people with chronic fatigue as part of their basic source of illness. Now that we know that multi-system, multi-symptom illnesses share not only proteomic markers, in SIRS, we have over 20 biomarkers, some proteomics, some not. And we look at chronic fatigue syndrome, for example. Another example of a chronic fatigue illness, we don't have

any biomarkers at all. Like with my algebra, there's no biomarker. So how can this be, that one discipline of chronic fatigue medicine has got 20 biomarkers shown in peer review literature, and you're a much wider literature in fibromyalgia and chronic fatigue syndrome, the experts haven't agreed on any?

Dr. Eric Grodon:
Yes, and they've wasted a lot of money looking.

Dr. Ritchie Shoemaker:
Well, we couldn't afford to waste any money. We didn't have much to waste. The latest invention, and a credit goes to Dr. James Ryan. Jimmy, as he likes to be called, noticed early on when we were doing next generation sequencing and sequencing 50,000 genes, that was a whole human genome, for a cost of about $2,000 a pop. We didn't sell too many tests. But the finding was that there was a marked consistency and ill patients. So suppression of production of ribosomal messenger RNA, and the implication is that you don't have mRNA for ribosomes. You don't make the proteins needed for ribosomes.

You don't make proteins needed for other spots. And so, well, what would happen if a host had a factor that shut down ribosomal RNA production? Well, the cell wouldn't do very well, but it probably wouldn't die. Along with that ribosomal problem and large and small ribosomes, both share the same findings, Dr. Ryan noticed that moderate ribosomes in mitochondria, mitoribosomes also were suppressed. Well, that's interesting. And then if we look at mitochondria and as you know, there's only 37 mitochondrial genes left in mitochondria themselves.

The rest nucleus. We talk about nuclear-encoded mitochondrial genes. Well, that means that in order for a mitochondrial gene to have any play inside the cell, it's gotta have mRNA made. Got a copy of the DNA. And if there happens to be microRNA or long non-coding RNA, or ribonucleoproteins around, that output can be suppressed and it is, very frequently. So if we say there's a mitochondrial component to an illness, are we're really just saying there's a mitochondrial gene suppression? Well, if we look at examples of ATP synthase,

which is suppressed as a bunch of genes, we know that ATP production, even if pyruvate gets into the mitochondria, which we'll come to that in a sec, that ATP synthase reduction will follow. So what if we have suppression of the electron transport chain? Cycle oxygenases, all that. What if those proteins are suppressed and mRNA is suppressed? Well, what will happen then? You'll have reduced mitochondrial function, but does that mean there's a problem with a ribosome? Functionally, no. It's like the plant you've left on your desk for two weeks. If you don't water it, it probably won't do very well. You give it some water, it's amazing how new growth will appear. But specifically let's get to translocases, 'cause most people don't realize that the outer mitochondrial membrane is not just a passive barrier to flow of one or two things.

There are pores or in some cases, voltage dependent, anion channels, about 20 nanometers in size, that must be open for the mitochondria to be fed the water on the plant we're talking about on your desk. That's how solutes, ions, ADP and pyruvate get across the outer mitochondrial membrane, and then mitochondrial proteins need the participation of translocases, trans variable location, location, location real estate, but it has to do with mitochondria. So if you don't translocate proteins made from mRNA by ribosomes, 'cause it's not being made or they can't get through, will the mitochondrial function be normal? No.

So this whole idea of Dr. Ryan finding what an elegant mechanism, and we've extended the last four years to show, we find this in heart failure, both dilated and non dilated, congestive and ischemic, no different than we see in chronic renal failure, we see in collagen vascular diseases, we see in people in chemotherapy, we see in radiation therapy to a lesser extent, but all of these findings are saying, is there a basic molecular mechanism to turn down energy production? Because that also turns down the energy demand for the production to occur, or do we also turn down the demand for energy production by turning on the mechanisms that are needed to produce that energy? So if the cell is being attacked and for sake of today's arguments, we're gonna talk about ribotoxins, and we're gonna talk about ribosome inhibitory proteins, but we need to have a quick-

Dr. Eric Grodon:
Let me just, one second. I just want to make sure that everybody understands what the ribosome is and does. It's where the RNA is read and made into a protein. Okay. And that's why it's so important because until the RNA is read, it's just a piece of a protein, of nucleic acid floating around, okay.

Dr. Ritchie Shoemaker:
The mRNA is 2000 nucleotides long, and microRNA is nucleotides long. We need to account for both of these different size particles in our processes of my favorite thing. Disease is, are you ready?

Dr. Eric Grodon:
Okay.

Dr. Ritchie Shoemaker:
Lack of regulation, of lack of regulation, of lack of regulation of gene transcription. Four layers.

Dr. Eric Grodon:
I'm not sure about all four layers, but I'll agree 100%, lack of regulation is the difference between health and disease. Absolutely. And you'll teach us about the four layers.

Dr. Ritchie Shoemaker:
If we continue on two more hours, we may have time to double back and talk about that. But proteins live in the nucleus, but they're not a nucleus. They don't have a membrane bound on them. And there's multiple genes functions for these ribonucleoproteins that we don't know. There's over 300 proteins associated with nucleic acids sitting in k-hell bodies and speckles and paraspeckles. You don't hear that on "60 Minutes" on the news. But at the same time, what are these regulatory elements doing? And then if we got long non-coding RNA, as we're finding out more and more about what they do to regulate gene production within microRNA-

Dr. Eric Grodon:
Oh yeah. I'm sorry, just one more little definition. I'm gonna keep bugging you on these 'cause I don't want people to follow. Long non-coding RNAs and microRNAs seemed, and correct me if I'm correct, have more to do with regulating. They are regulators rather than things that we're busy transcribing and making into proteins.

Dr. Ritchie Shoemaker:
And same thing with ribonuclearproteins as well. They all the best that I could tell. There may be a few non-regulatory functions, but at the same time, if we look at the control of RNA, we look at transcription for example, and there are some elements that are involved with this. Epigenetics, talks about methylation, but more importantly is acetylation and more important is deacetylation and more important is demethylation. But the regulatory aspects of gene transcription are remote. But imagine if you've been working hard in the fields all day, making them RNA and you release it in the nucleus, knowing that you've given free passage to this dove of peace of all this 2000 nucleotides. It's gonna traverse the nuclear membrane and get into the cytoplasm, and you find a ribosome. Isn't that exciting birth defining event, until a missile comes along, a microRNA, and destroys that microRNA complex. What happened to your mRNA? It was made normally. Regulation of DNA was morally functioning. MicroRNA just shot it down. Oh, no, all that wasted nucleotide. Is the nucleotide actually wasted or does it get recycled?

Dr. Eric Grodon:
Hopefully recycled.

Dr. Ritchie Shoemaker:
We can talk about autophagy another time. Maybe we can talk about apoptosis and viral infection and COVID 'cause they're all tied together, but there are no cell materials truly that are wasted. But anyway, I digress. By looking at regular or lack of saying, we're also looking at the model for a ribotoxin system to disrupt protein synthesis. Now let's take out your microscope and I want you to look at a structure between the large and small sub unit of

ribosomes, both large and small ribosomes. These subunits surround a little structure called, the sarcin-ricin loop. Now you've heard of ricin, right?

Dr. Eric Grodon:
Very effective, yeah, killing people. Yes. So, oxygen and ricin.

Dr. Ritchie Shoemaker:
Ribotoxin made by the castor bean. But how come it's got its name with the sarcin-ricin loop? Ricin exerts its negative effect on life by disrupting in this loop of nucleotides called the loop, sarcin-ricin loop. In the 15th position, there's an adenosine moiety. You remember GCAT in your DNA? Well, this is the A, and it's part of a loop. And with adenosine, there can be initial attachment of a three-codon piece of mRNA, called attachment. There can be a sequential attachment of another three-carbon, three nucleotide piece called elongation. And then there can be a stop signal that comes out and other three-codon nucleotide called, termination.

That's how protein synthesis is supposed to work. mRNA signal says, put together 25 amino acids, 30 amino acids, whatever the code says, and you make the protein. Only with ricin and sarcin, sarcoma inhibitors, the names aren't too fancy, they knock off the ability for that mRNA to attach and certainly knock off the ability to elongate and certainly knock off the ability to terminate. Oh my goodness. How do you get any protein made? The answer is, if you're poisoned by ricin, very often you'll die. But what if you were poisoned by exposure to a Coryne bacteria? One of the ones we know about was diphtheria that makes toxins, but it makes ribotoxins like crazy. It's an actinomycin.

And lo and behold, the reason we don't talk much about mycotoxins anymore is while they make ribotoxins, they're chronically activated very easily by glutamine, and they don't really do very much. About 7% of people with SIRS, have mycotoxin injury. Compare that to actinomycetes, the biggest genus by far in all of microbiology. Mycetes is, of course, way up there in that collection of but specifically there are 42% of SIRS patients and then lowly endotoxin, the thing we want to do ignore, except if you were septic is 28% of chronic illness.

We know endotoxin by looking at NeuroQuant, the distinctive pattern of loss of gray matter nuclei and dilated superior lateral ventricle and loss of cortical gray tells me almost up to a percentage point, that endotoxin was involved and initiated for this illness. If you have problems with mycotoxin, you'll have a lot of inflammatory problems. If your problems with endotoxins, it's brain injury. If you have actinomycetes, it's metabolic problems because actinomycetes knock out complex I, with pure and complex III with oligomycin, all the electron transport protein chain. So, if you want-

Dr. Eric Grodon:
Just for one minute. I mean, you just you have said a lot of very important things, but especially, so let me just go back for a minute. So when you're seeing endotoxins, that's when you would be thinking more about those with the people, the more neurologic presentations, to have that lined up clinically?

Dr. Ritchie Shoemaker:
No. They have a 37 symptom program, like all presentations do. symptoms, but you can't distinguish the metabolic source of injury from the endotoxin mechanism injury based on symptoms. Symptoms remain. Some people have argued with me in the HHS meetings for Lyme disease. I said, symptoms are probably the worst mechanism to use for delineation service that there is. And someone else said, well, my Lyme patients say they're the very best. And I said, your group was symptoms are no different than my group of symptoms. And I know they aren't good.

Dr. Eric Grodon:
Okay. Well, that's the thing. I mean, 'cause we've been flying on the symptom train for a long time, because I said in the past I always found the lab tests to be non-specific for causation. And you're right. And everybody's, I always laughed. One man's Bartonella symptoms is another man's Babesia symptoms. So we can't be too attached to that.

Dr. Ritchie Shoemaker:
Come on. Mold patients got just exactly the same as Babesia patients.

Dr. Eric Grodon:
Absolutely, absolutely. But there's flavors. I mean, at least we think there are flavors.

Dr. Ritchie Shoemaker:
Sorry. You stir up the ice cream. You got chocolate and strawberry. They all turn out to brown. What are you gonna do?

Dr. Eric Grodon:
Okay. Well, but just going back. What you're saying is that even though that you find that the endotoxin predominant person will have more likely a NeuroQuant, a specific pattern on NeuroQuant, you're really not directly relating that to symptomatology.

Dr. Ritchie Shoemaker:
Symptomatology remains the study of symptoms, and we're not really talking about that. My understanding that symptoms need to be corrected for people to regain perceptions of health, but it also maintain that correction of objective biomarkers, molecular mechanisms is necessary to eliminate disease.

Dr. Eric Grodon:
I love it. Keep going. Okay.

Dr. Ritchie Shoemaker:
So, perception of disease, mechanism of disease, which do we want? We changed the chronic fatigue syndrome world, chased after symptom rosters for years.

Dr. Eric Grodon:
Oh yeah, ridiculous. Absolutely, you're right.

Dr. Ritchie Shoemaker:
There's no point in arguing about it. Let's get something else. So the mechanisms then get to be one that we can say does one protocol fit all? And if you have molecular

hypermetabolism, the beauty of the one protocol that I've used since 1997 is that it corrects molecular hypometabolism. It corrects proliferative physiology. And if you don't know that you have that, you're gonna say, I feel pretty good. My symptom is saying proliferative physiology is not hurting me. That's right. When a cell's dividing, making plenty of building blocks, there's no shortage of building blocks and things feel pretty good. Cells aren't having apoptosis. They're not dying all the time, but meanwhile, the brain's being rotted. Meanwhile, pulmonary hypertension is being accomplished because of those exact same mechanism. And Otto Warburg, while he left out glutamine in his assessment, he didn't know where the ammonia was coming from .

It has to do with glutaminergic pathways that we know about in biosynthetic pathways themselves. But the key issue is that you get a false sense of security when you take an antifungal. You say, I feel pretty good. If you're taking your Itraconazole, that blocks the VDAC. Nothing gets through. So you say, well, I'm feeling pretty good. Meanwhile, your brain is dying. Meanwhile, your pulmonary artery pressures getting bad, and by the time you leave the doctor and go to a new one, he says, don't use anti-fungals. That's when we find pulmonary hypertension to be bad. That's when we find that NeuroQuant is showing the complications from endotoxins or from actinomyces, which also blocked the VDAC.

Dr. Eric Grodon:
Well, this is perception mechanism. I'm with you. We like to treat the mechanism when we can. It's as I said, the thing about medicine is that we see each other's failures and we see where things don't put, you are learning and learning, and that's what's so exciting about the gene, is I think that you're getting more and more of these pieces and I'm just very excited that you're putting this puzzle together for us. So...

Dr. Ritchie Shoemaker:
Have you ever worked up somebody for a TIA?

Dr. Eric Grodon:
Yeah.

Dr. Ritchie Shoemaker:
Sure. And what do we say? Transient ischemic attack? It was transient. Well, it didn't last very long. Ischemic means lack of blood flow, but where was the attack? It doesn't show on CAT scan. It doesn't show on MRI, three Tesla coil, but it does show on a nine Tesla coil. and TIAs are now capillary hypoperfusion that go onto microclots and microbleeds. And in the areas of capillary beds, there will be the presence of amyloid beta protein hooking onto coagulation compounds, creating the ability to have a clot in a microvascular circulation and with no blood flow going beyond the clot. Guess what? You've got distal hypoxia which serves as a stimulus for what?

Phospho-tau. So are we looking at a mechanism, the vascular hypothesis of neuronal injury? I wish I could say it was my idea. Sidney Strickland from University of Rockefeller in New York is one who's written more . It's absolutely fantastic. But what was the vascular basis of the clot initiation? Is it the clotting factor that we can measure? Heaven forbid there would be a laboratory that would do all the clotting factors we can get compared if we look at the genes for clotting abnormalities. Oh my goodness. In the integrin deficiency, BP6, GP6, GP9, where did all these things come from? Where's factor five? Where's factor 12? Well, they're there too. They're probably five to 10% of what we want to

Dr. Eric Grodon:
Life happens. I mean, that has always been the frustration, is that the clotting systems that we can look at through regular blood tests are clearly only a tiny component because we see lots of people, everything is normal and they still have hyper clotting events or microthrombi. Yeah, all the time. So, I mean, again, so with Genie, you can see the genes that are up-regulated and turned on or suppress that will create these clotting abnormalities.

Dr. Ritchie Shoemaker:
Absolutely, you can. One of the exciting things was to correlate NeuroQuant abnormalities with the vascular hypothesis and neuronal injury. But what we can see is that the mean number of gray matter nuclear atrophy together with white matter and gray matter

together, two areas, is 6.15 out of eight if you've got four or more coag genes, upregulated. Does coagulation genes up association with brain injury? The best part is when you fix the gene, we can heal the brain injury.

Dr. Eric Grodon:
Okay. Now that's exciting. Okay.

Dr. Ritchie Shoemaker:
That was done in 2017 website. Take a look at it.

Dr. Eric Grodon:
Okay.

Dr. Ritchie Shoemaker:
This VIP, we now know the VIP corrects the coagulation abnormalities. So what were we doing when we fixed gray matter nuclear atrophy? Likely we're fixing the vascular source of that at all.

Dr. Eric Grodon:
Yeah, okay. Yeah, and if you take away, what I call . I forgot your word for the pro proliferative. Yeah, proliferative metabolism. You can let things actually heal instead of scar.

Dr. Ritchie Shoemaker:
Eric. It's vitally important.

Dr. Eric Grodon:
What? I'm not rushing.

Dr. Ritchie Shoemaker:
No . But you spoke Russian. I know . God forbid. But proliferative physiology is a word that was part of your vocabulary, and I want it to be part of everybody's vocabulary. If we are

having proliferative physiology, we either are pumping glucose into the biosynthetic pathway to make new cells, or we're in a situation where we won't have pyruvate transported across the outer mitochondrial membrane to get into the mitochondria to forward energy production. So that means lactic acid. If you've got lactic acid locally, there will be a metabolic acidosis. Is that metabolic acidosis going to be stimulating phospho-tau?

I haven't heard anybody explain that, but hypoxia and lack of energy goes together with lactic acidosis. So I think it will be a factor. But having said all that, as we go further down, what a Genie report will show, we looked at cytokines and that was very exciting because so many people will get a Luminex panel and get 15 cytokines, not knowing on average, 30% of those are gonna be wrong.

Dr. Eric Grodon:
Yeah. Those are my most disappointing tests. I do them rarely. And then every time I do, I'm usually sorry.

Dr. Ritchie Shoemaker:
Even more sorry, are the people that use ELISA testing for cytokine abnormalities. There are so many similar structures or epitopes, that those are not really very useful. So the question is, how really are we gonna assess protein modification, of which there's 300 different kinds, that will affect proteins after the mRNA has done its thing and after the has done its thing. You've made the protein and now it gets changed. That's where the diversity of the human organism comes in, is protein diversity by modification. So it get all very complicated in how can you measure approaching accurately if it's been modified?

Dr. Eric Grodon:
Yeah, with difficulty.

Dr. Ritchie Shoemaker:
So, there we go, back to gene analysis. And now in order to do gene analysis, guess what you need, Eric?

Dr. Eric Grodon:
I'm waiting.

Dr. Ritchie Shoemaker:
A control group.

Dr. Eric Grodon:
Ah.

Dr. Ritchie Shoemaker:
And guess missing most of the time and people exciting events and exciting findings, exciting discoveries is the null hypothesis says, everything you said is wrong. And that's unfortunate that science has that null hypothesis. But it's so often the case that, you know, I did this 50 times and it happened. It was like flipping a coin, 49 times it came up, tales. Only one time it came up heads. So it's 49 to one. That's significant, isn't it? Well, maybe it is, but the statistics aren't getting to the point that he can't prove it, statistically, it probably is not going to satisfy the null hypothesis. And gene transcription needs a huge and control group. And I can remember Jimmy Ryan still to this day saying, I need more controls, I need more controls, I need more controls. So every advance that we make in science, usually there's a step backwards.

Dr. Eric Grodon:
Okay, great. You get the idea, you try it and you find out where it didn't quite hold.

Dr. Ritchie Shoemaker:
And then you can either adapt your protocol or adapt your module, or ignore the fact that there was a failure, and the data don't lie. And that's one of the things that really matters. And so if we started looking at gene data, we can get those very nicely in any number of different places. We'll give you a Z score or comparison at .05 statistical significance of the difference of the gene from controls. And that comes vitally important when we start

looking at some breakthroughs. I don't know if we've talked to you about in multiple chemical sensitivity.

Dr. Eric Grodon:
No. Another great quandary. Yes, I'd love to hear.

Dr. Ritchie Shoemaker:
patients coming in 'cause I knew they were suffering and I felt their pain, but I couldn't do much of anything that worked. What I didn't have was a case definition. What is MCS to you might be MCS to me, maybe, but maybe not. It was a Supreme Court justice who said, I know pornography when I see it. Well, I used to say, I know MCS when I see it, and sometimes they saw it and sometimes they didn't. This is a very humbling disease. But specifically, if we look at an anti-inflammatory group of zinc finger proteins called Ikaros, there's three of these genes. We add up their Z scores compared to controls and we give a positive number. Then the comparison to VIP receptor one, yes, that's the VIP receptor itself. Who cares what VIP levels are.

I want to know what the receptor shows, but if the receptor is negative and Ikaros is positive, that mismatch correlates 85% with people with environmental sensitivity and environmental sensitivity can be multiple chemical sensitivity, food sensitivity, or drug sensitivity. Fascinating. A non-specific finding in, like you said, it doesn't say what chemicals a person reacts to, just as they do. Conversely, we had a case today, a great case. Person has been doing beautifully. Hypermetabolism has been fixed. Peg DiTulio has been doing a gorgeous job.

She's in New Hampshire. Everything's looking fine, as the guy still has some brain injury and he has some anxiety that's not fixed. Well, he didn't have the mismatch of positive Ikaros in negative VIPR1. He had the reverse. Negative Ikaros in positive VIPR1, which is associated with accentuated CNS injury. He had exposure to endotoxins. Guess what? He has superior lateral ventricle dilation, cortical gray atrophy, and five out of six gray matter nuclear atrophy. So he had gray matter problems up the wazoo. And he's gonna need to be VIP for a year to

fix the cortical gray and superior lateral ventricle. Well, we now know we can fix that. Back when you and I talked, where was that conference anyway? Before COVID.

Dr. Eric Grodon:
Oh, right. Right. We were in Texas.

Dr. Ritchie Shoemaker:
Houston, that's right.

Dr. Eric Grodon:
Houston, right, right, right.

Dr. Ritchie Shoemaker:
I didn't know about CNS injury back then. Didn't know about MCS back then. So it doesn't matter if you wait long enough. Something is bound to stumble on your door some way to another.

Dr. Eric Grodon:
I mean, 'cause yeah, MCS is just one of those things that, yeah. We're looking to turn down the reactivity, but it's different. I mean, the reason it's hard to define it, is because as I say for me, most of the people I see, the diseases, it's their individual response that the problem lies. It's not the Lyme. It's not the mycotoxin or the water damaged building toxic. It's how their body responds because, you know, 10 other people have the same exposures and kill fine. So it's all about the individual. But the MCS are even a more refined group of that, because,

Dr. Ritchie Shoemaker:
One of the more humbling elements in medicine is that if you find that you can identify a objective parameter with MCS, you're part way there. the illness, you validate the illness in skeptic size, insurance company size saying, I can show you the gene basis or why I react to air freshener or cigarette smoke or any of the diesel fumes. And the list goes on and on and on. But every one of those patients we saw and didn't help, we tried to, yes we did. But they

were telling us, I have a mechanism that's gone awry, my illness. I may react differently than my friend and my neighbor, but I've got a mechanism that's bound to be one you can find. Exactly that has happened. And as we go further looking at metabolic abnormalities, beta tubulins to beta tubulins A4A, BB1, there's a whole series of them, are associated with the ability of cells to divide. Proliferative physiology looks at cell division. What if that microtubule is not able to attach to the centromere, that section of the chromosome that has a kinetic core protein, that's where the microtubule attaches.

Microtubules should pull one chromosome to one side and the other chromosome to another side of the dividing cell. It divides down the middle and boom, you got two identical cells. But if the centromere is not functional, the kinetic core protein is not functional because the tubulins are blocking the voltage-dependent anion channel, will we have cell death of the reproductive ? Yes. So this is a bad actor. So when I said the physiology gives you a false sense of security, you're also creating an element of death of the offspring.

Dr. Eric Grodon:
Wow, okay. And do those guys die peacefully or do they fall apart? I mean, are they really going through apoptosis, or they're going through other kinds of cell death?

Dr. Ritchie Shoemaker:
Depends on what mechanisms are active for apoptosis. For many that have viruses, especially with activation of BCL2 and our post COVID syndrome, our paper was published yesterday and I sent you a copy of it to you.

Dr. Eric Grodon:
Yes, I read it. It's exciting.

Dr. Ritchie Shoemaker:
Here they are. But the issue is that if we look at this viral evasion of apoptosis, apoptosis is a mechanism, kill the cell and kill the virus that's in it. Virus says, I don't want to be killed. So it sets off blockers of apoptosis, you block the classical pathway. The cell membrane never

forms around the guts like it's supposed to, of the cell contents and the cell doesn't die. But what if you have defective apoptosis, a gene, RIPK1 turns on the . RIPK1, IP3, LR3. There's a whole bunch of them we don't test for, but this is a mechanism to kill the cell without going through apoptosis. So you were released free DNA, you release ribosomes, you release .

Dr. Eric Grodon:
Yeah, very inflammatory.

Dr. Ritchie Shoemaker:
Boy, talk about a cytokine storm. Now I use that term in 2001 talking about Lyme disease when people got Cholestyramine. They felt horrible. And believe it or not, cytokine storm is still in our lexicon thanks to the effect of COVID. It's not new. It was described 20 years ago.

Dr. Eric Grodon:
Yes. Yup. We saw it then. So, going back, I said, actually just one thing for, the Ikaros. What are they coding for?

Dr. Ritchie Shoemaker:
Ikaros are a group of anti-inflammatory genes. When you have Ikaros turned on inflammatory genes get turned off. The best example is APOA4 and all of its genes that it's is blocked by Ikaros. So if you don't want to have an APOA4, you'd rather have APOA2, you're not likely cardiovascular event. But if you have problems with Th17, TReg imbalance, you're gonna have a cardiac event whether you've got APOA4 or not. We can tell you that with Genie as well.

Dr. Eric Grodon:
Oh, okay. What's so exciting is how many pieces are coming together from different. I mean, you're sitting there. Like you were saying, describing dementias, and there's so many different types of chronic inflammatory. 'Cause basically my worldview, chronic disease is chronic. It's just dysregulated inflammation. And you're sitting there kind of telling me that you've got a way of looking at the control panel for a lot of that.

Dr. Ritchie Shoemaker:
We add metabolism, and you're not wrong. Like I told you, you take science. We go as far as science will let us go. And when inflammation was all we could measure, that's what we thought the problem was. is shown out to be a problem with, you know, hypometabolism, especially on a molecular basis. That's also saying that is added to inflammation and the material metabolic abnormalities create inflammatory processes.

Dr. Eric Grodon:
Well, I guess, it's how you cut the circle. In my stories, the inflammation is often what is causing the hypomania metabolic state, right? It doesn't really matter, I mean, 'cause at the end of the day, it's getting the system back to self regulation and modulating this is gonna get us back to health.

Dr. Ritchie Shoemaker:
I think there's an expression, the rounder we go, the faster we get. And we're chasing inflammation and chasing metabolism with metabolism and inflammation respectively. The rounder you go, the faster you get. The answer is, if we stop the ribotoxin initiation of the protein abnormalities, good things will happen. You get off the boat and you start using four-letter words that are dear to my heart. I never used them much in the past. They're called, cure. When you fix metabolism, you fix inflammation and you show that the steady state's been achieved for six months because they're out of re-exposure, life's good, very good.

Dr. Eric Grodon:
Yeah. No, this is excellent. So, we're running through this, the fields of Genie. So how are you, right now you're doing how many, you're measuring about a hundred and, you said 180, 188, transcriptome. Actually, yeah.

Dr. Ritchie Shoemaker:
Then we showed that we had 2000 near abouts, genes that were upregulated or downregulated in our SIRS patients compared to 50,000, all told. And the question is, all

right, what flavor of candy bar would you like Johnny? You're in the candy store. You only get . So what Jimmy did was pick out 188 with the highest signal to noise ratio. So the most bang for the buck. So the low signal ratio like interferon, we don't include, 'cause it's just not good enough to separate out. If we get a hit on interferon, is that signal or is it noise? And if you ask me to define how Jimmy figured out signal and noise, I'll refer you to the methods that he wrote there in our last paper 'cause I didn't write it, and I can't tell you.

Dr. Eric Grodon:
Okay, yeah. But you came up with the 188. And how are you, right now, when you look at, like I said, the post Lyme people, Lyme patients, chronic fatigue, the water damaged building components, as you say, and the mycotoxin people, you know, how much crossover are you seeing or how much are you able to really delineate the groups?

Dr. Ritchie Shoemaker:
I used to talk in lecture about peeling the onion. I think you might've given a similar talk yourself, do one thing at a time. Get down to the kernel or the inside. We have to do multiple things at a given time because multiple changes of drug intervention of a given protocol will be occurring. It's not any onion at all. It's many onions all being peeled. Some are being peeled faster than others, but each has to be peeled to get to the final kernel of all of them. That's where the cure lives. The mistake that I made was thinking one intervention, one change. It was one intervention and multiple changes that I didn't know about happening with the one I did know about it.

Dr. Eric Grodon:
Yep. So, that's when you work with the body. That's kind of what we depend on when we work at the body. That's what healing is about. We do one thing and then the body goes off and does a lot of stuff. We said it was easier to fix cars. Actually it's easier to fix people sometimes because cars don't heal themselves, people do. So, get with the idea that you don't have to be right all the time. If you start the process, sometimes the body will continue it. But getting back, I want to get back to the Genie test 'cause I said I was interested in it, but it sounds like you've taken it to a new level now, is something I really want to

understand. So are you able to delineate just. I mean, I know you feel you can delineate treatments, but delineate the major drivers, if you will. Are you predominantly looking, you know, like you say, at the mechanism? And again, very appropriately, I think not worrying about what necessarily triggered it, but what's going on in the individual today?

Dr. Ritchie Shoemaker:
Well, if you read the paper we published in March, we've been publishing a lot lately, you're seeing for the first time, depiction of precision specific causation. And we're looking here, people exposed to actinomycetes, we have an environmental sample where in dust we find more than 16 or more species. We also find immune reactivity with MAP kinases. Low-level reacted. Mycotoxin's very high level reacted, but we also then have the third component, that if you've got exposure confirmed and you've got MAP kinases, nonspecific with stimulators, a whole series of downstream anabolic and catabolic events, both reacting, and you have TGF beta one receptor activity, we have got specific causation.

Now Scott McMahon wanted the word precise coming there. He has medical legal reasons for wanting to include that. But specifically for the first time we can tease out actinose out of the vortex of amorphous items, that 32 different categories of things that make people sick, known in water damaged buildings. We can also... Daughter's having a tweet storm. look at endotoxins with specific causation for them. CD14 and toll-4 are specific for endotoxin. So in answer of, can we separate Lyme out? Yes. We use the work that came out of San Francisco, by the way. and Charles Chiu from UCSF and John Alcott from Hopkins. Maryland's gotta get their name in there somewhere, but he looked at people with acute Lyme manifested by a bite and an EM rash and an illness as though he had an EM rash in there. So if he didn't have an EM rash, maybe weren't covered by a study.

But he treated people for three weeks with Oxy and then didn't give any more antibiotics. Of course it's Hopkins. And then looked at them, finding six months later, what genes were still abnormal. Well, the whole slew of them, of course, 'cause they were gene from Lyme that were not being treated. But we can sort out those genes, and that's one of the elements. We have undiagnosed Lyme disease or Lyme that's been treated within six months. So that's

made big progress. If we've got someone who worried about Bartonella, we look at defensins because other bacteria, other viral infections are there, Bartonella lights up like a Christmas tree. So it's really says I've got Bartonella and they went to galaxy and maybe they had a test and maybe they didn't, you know. Ed had, we were both given a talk at the American Society of Tropical Medicine and Hygiene years and years ago. And the elevator got stuck between the first floor and the lecture hall. So we had 45 minutes to talk in the dark about Bartonella and Ed talked mostly the whole time.

There's 28 different species of Bartonella, that he identified they were pathogenic in dogs. Nine were pathogenic in people. have Bartonella and not know it. And I came along in 2003, we had a fellow, actually it was 2003. For the first time he published a silver methamphetamine stain of Bartonella in a lymph node, and that was exciting. So we took a lymph node out of a patient with Bartonella who had cat-scratch fever, as we called it back then. and I probably pronounced that wrong. But we sent it off to him and he grew it out of our lymph node, the first in the world.

Dr. Eric Grodon:
Oh wow, that's great.

Dr. Ritchie Shoemaker:
And you can get cat-scratch fever from lots of things. We had guy with a monkey scratch. It wasn't a cat. He was at a zoo. He got a cat-scratch and there was. Epitrochlear node, positive for Bartonella. Unbelievable. Plumbers working underneath crawl spaces and all that is a problem.

Dr. Eric Grodon:
Yeah, yeah. Yeah, I know. Bartonella is a nasty. So the defensins definitely pop up, high. The other thing, were looking at some T-cell reactivity these days to get a better idea of when the bug is actually active. But that would be interesting correlations.

Dr. Ritchie Shoemaker:
Tell me about your T-cell assay, because if you've got CD3D deficiency, that is the CD marker for the interaction between an antigen presenting cell and a naive T lymphocyte. If that gene is downregulated, you won't have that interaction. You won't have T-cell reactivity at all.

Dr. Eric Grodon:
Well, that could explain, maybe some of the negative tests and people who we think have a Bartonella. But, you know, that is always the problem with every test when we're looking downstream, like, generally would we do in medicine. I mean, this has always been the issue. If the immune system isn't working the way we want, that's what we've always been able to look at, is just immune, like IgGs and now, and also T-cell reactivity. But yeah, if the communication isn't working, it's not gonna show up.

Dr. Ritchie Shoemaker:
If we go back to COVID for a minute, defective antigen presentation is of concern in vaccination. I get the question every day, near about. Should I get vaccinated if my CD#d is downregulated? Well, chances are that you run a risk of having defective antigen presentation. And so, your negative test is an antibody based test. The antibody is dependent on having normal antigen presentation all the way through, and there's no guarantee that that's gonna be the case. So that's why physiologic elements make more difference to me than antibody tests.

Dr. Eric Grodon:
Yeah, yeah. I'm with you there. That's right, your poor T-cell. Every area is so dense. Immunology is what you know of far better than I, that we just keep finding more different cell types and more different ways that the cells communicate with each other. I mean, years ago, people thought that B-cells and T-cells, they didn't realize how B cells have huge amounts of regulatory affects on T-cells. I mean, everything's in communication. The body is one big soup.

Dr. Ritchie Shoemaker:
There was an editorial in "Nature," reviews immunology years ago. He was talking about the different phenotypes for natural killer cells. You said there's 28,000.

Dr. Eric Grodon:
Okay.

Dr. Ritchie Shoemaker:
say you're wrong. There's not 28,000. There's 228,000.

Dr. Eric Grodon:
We have to split and lump in order to talk about things. We just have to remember, that's often not what's really happening, but it's what we need to do. So, just as an overview. So with the Genie tests now, how are you using it clinically?

Dr. Ritchie Shoemaker:
I use it to look for, let's just start with post COVID people. TGF beta one signaling is gigantic. We've all known about pulmonary fibrosis and interstitial lung disease was dependent on epithelial-mesenchymal transformation or EMT, run by SMAD, turned on my TGF beta one receptors. Well, guess what? That's a huge player in post COVID syndrome for people that have COVID and have recovered. Some people have symptoms that affect activities of daily life, other people don't. And if you're still sick, six weeks later with impairment of activities of daily life, I can almost guarantee you, that 64% of your people like you will have endotoxin reactivity and 56% will have actinomycetes activity.

This is incredible. The COVID patients are released to go as a deformed host as effective host, as effective advantage presentation host into an environment that was safe before. But now, because these organisms live in homes hugely throughout the U.S., they are now exposed, and now they're gonna pay the price. So is the gradual accumulation of new symptoms, a result of post viral, and expansion of the transcriptome, or is it new susceptibility, new

priming events to old pathogens we could ignore and fight off before? I think that we cannot determine that until we treat with something like Cholestyramine for two or three weeks before jumping in with the VAP, which will fix TGF beta one receptor. So now that we've got specific layers of treatment, we can conclude specific layers of injury.

Dr. Eric Grodon:
Yeah. Well, this sounds similar to, you know, I think you said this. It's been a long time. I always liked it though. We did see that many people did not become quote unquote, water damaged building sensitive, or mycotoxin sensitive until after they had an infection like Lyme, and then later became, you know, much more sensitive to their environment. Is that something you think something similar is happening or exactly the same?

Dr. Ritchie Shoemaker:
I use the term, a cytokine priming event. And he'd be a cytokine dominant. For example, one person got bitten by a tick in Connecticut and never had a problem until he had yellow jackets by the handful sting him. He had six or seven stings. And shortly thereafter, he started getting Lyme disease, routinely. But something was changed with HLA. Something was changed with a molecular control mechanisms. Boy, that sounded kind of bad. I don't know what it is in COVID. I wish I could say it's RPK1. It's simply not. Just RPK1, but that's an intensely inflammatory element. So we use it for post COVID syndrome. We use it for people who don't feel well. We use it for people that know they've been in a water damaged building. We use it for people, especially if they think they have mycotoxins, are still sick. They take antifungal and it doesn't fix the mechanism. But if you go after the physiology, antifungals have their own presentation right there. We can see it. Basically a shutdown VDAC of the wazoo.

Dr. Eric Grodon:
Okay. And are you changing your program, as far as the steps in your program based on the Genie or does it just make you feel that you better know what to, yeah. What are you doing differently basically, with Genie?

Dr. Ritchie Shoemaker:
Haven't changed this order of events and order of steps at all. I've been using a low dose VIP program for people with environmental sensitivities as a run-up to using any medications. That's been one change because we can show correction to CD3D with that one. But specifically when I jumped in with Genie, found that by skipping steps in my protocol, I actually was not helping anybody at all. And we still say, remove from exposure, a month of binders with a minimum, continue with binders or eradicate MARCoNS.

We did be able to show that if MARCoNS is present, but mitoribosomes are normal, you don't need to worry about the MARCoNS. But if my ribosomes are abnormal, they're the polycyclic ether toxins were made by MARCoNS. That's been the real bugaboo, is that we were able to show in multiple mass spec studies, that these are new unknown polycyclic ethers were made by MARCoNS, but they're not in any library, the fragmentation. Well, you and I were gonna run up .

Dr. Eric Grodon:
Yeah, right. I know. I wanted to do something with that. Sorry, I wasn't able to come through on that, because this is huge, because that's always been the issue is, whose MARCoNS to treat?

Dr. Ritchie Shoemaker:
You don't have to treat. Take it from me.

Dr. Eric Grodon:
What was that again?

Dr. Ritchie Shoemaker:
If your mitoribosomes are normal.

Dr. Eric Grodon:
Ah, if the mito, okay. Well, I mean, right there's a good reason to do the Genie 'cause I mean, there's a lot of MARCoNS and you just hate to be treating what's not gonna, especially since so many of the times, the MARCoNS, you treat it and it's one of those things that if the immune system is able to get rid of it, six months later, it's back again, it's there, and it's colonizing you. And it could be, in many people, it is just a commensal, obviously.

Dr. Ritchie Shoemaker:
We had to retreat away from BEG spray because We over to silver methamphetamine or silver stains, excuse me, silver mixed up with EDTA. That did fairly well. Witch hazel preparation came out. And guess what? Every attempt to kill and eradicate by killing, didn't work. If we suppress biofilm formation, the normal immune responses in the nasal mucus, which are fascinating, you know, there's 400 organisms at have given time in each milliliter of mucus that people make. When you blow your nose, there's 400 organisms, 4 million organisms. 400 organisms, excuse me, sitting in your Kleenex.

What are they all doing? They're fighting for their own place. You've got fungi, actinomycetes, the bacteria, FAB. In every mucus membrane known, you've got FAB. If you find one out of proportion, yeast vaginitis, well, what really is dropping out are actinose regulating Moraxella for a classic example. suppressed. So if you go out of the world of MARCoNS and you've got too much bacteria, you bring that back into play, we're playing EDTA for six months. It's inexpensive. It works. You wait until the normal micro biologic environment re-establishes. But all you do is you put things back into pecking order.

Dr. Eric Grodon:
I liked that, I like that. It does make... Clinically what we've seen also is that focusing on the biofilms, yeah, is getting good results. It's amazing how, how many people's brains clear just with that.

Dr. Ritchie Shoemaker:
If you don't have polycyclic ether, you've got a chance to start clearing your brain. Although as much as other people like to say, spontaneous healing of NeuroQuant has not occurred yet. We have 5,000 NeuroQuant in our data set. I haven't seen it yet. You need to use medication, VIP usually, to fix brains.

Dr. Eric Grodon:
Yeah. No, no, absolutely.

Dr. Ritchie Shoemaker:
But in terms of mechanism, are we looking at correction of gray matter nuclear atrophy by self healing? No.

Dr. Eric Grodon:
Turn off the inflammation. I don't want to digress far 'cause I would want to talk a little bit more about your work with the water damaged buildings. But just a little bit, in fact, you know what I'm gonna do? I think I'm gonna just wrap up this one because we want to keep it to an hour and then we're gonna come back, 'cause I want to talk a little bit about COVID and hypercoagulability, it's just one of my little favorite subjects. Just wanna hit that one. Maybe we'll do that just before we end. You can tell me what your feeling has been. because I hadn't seen a lot of COVID patients, just by the nature of, I live in a county where they locked down hard and people didn't have to go to work, those who I see. So, I mean, it's really, it's amazing how socioeconomic diseases has been on some levels, you know?

Dr. Ritchie Shoemaker:
Okay, well, when we come back, we'll start with the coagulation percentage and controls cases, PCS negative and PCS positive and the p-value.

Dr. Eric Grodon:
Very good. Just one second here. So.