Christopher Shade: The Human Detoxification System

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Female: It's an honor to introduce our speaker, a friend, Dr. Christopher Shade. Dr. Christopher Shade is a globally recognized expert on mercury and liposomal delivery systems. He has lectured and trained doctors in the US and internationally on the subject of mercury, heavy metals and human detoxification system. Dr. Christopher Shade obtained his BS and master's degree from Lehigh University in environmental and aqueous chemistry. Dr. Shade earned his PhD from University of Illinois where he studied the environmental and analytical chemistry of mercury as well as advanced aquatic chemistry.

During his PhD work, Dr. Shade patented analytical technology for mercury speciation analysis and later found Quicksilver Scientific in order to commercialize his technology. Shortly after starting Quicksilver Scientific, Dr. Shade turned his focus to the human aspects of mercury exposure and the human detoxification system. He has since developed cutting edge, lipid-based delivery system for nutraceuticals such as liposome and micro-emulsion system to address the growing need of high quality, affordable detoxification solutions. He has also developed specific clinical, analytical technique for measuring mercury exposure and a system of products to remove metallic and organic toxins by upregulation of innate detoxification biochemistry.

Quicksilver Scientific is the only lab in the US that separates organic mercury from inorganic mercury from the sample. It's an important factor because it is nice to know where a source of mercury is. His current focus is at the intersection of neuroinflammatory issues, immune dysregulation, toxicity and infection, specifically how to peel away the layers of overlapping dysfunction in the sick individual until you get to a point at which the system rights itself. Without further ado, please welcome Dr. Christopher Shade.

C: I don't need that. I have lots of amplification going on. Sook is my dentist, by the way. Back up, all right. Does that go back up? There we go. I know a lot about mercury more than you'll ever want to know about mercury. I got my PhD in mercury and it was environmental chemistry of mercury. At the time, the government wouldn't give any grants to people studying mercury in people but you could learn anything you ever wanted to know about mercury in fish, birds, different wildlife, what it does in the rain, what it does in the soil. That's what we did.

All the best mercury chemist were in environmental at the time. We had tools for predicting what was going to happen with mercury here, there and everywhere. I brought some of those tools into the clinical world because long before I did my PhD, I was disillusioned with science and left, became an organic farmer. I was a biodynamic farmer out in the woods and lived on a little tent and stuff. I had a holistic mind but the world threw me back into science. I was lucky enough to learn really good science tools to frame holistic thought and really bring that into a world where we had a lot of clinical metals toxicology that was very black box oriented. We're measuring your pee, see what comes out. We'll put a chelator in and if mercury comes out, that's bad. We'll give you a chelator, make you get rid of it and these ideas that you can never get rid of toxins without having specific antidotes to them like chelators.

The reality is that you have very complex mechanisms in your body for dealing with toxins. You have a lot of stress response mechanisms in your body that are supposed to be able to flush these things away. It's only really in situations where we get very acutely exposed where we need to move to something like a chelator in industrial exposures where it's just really beyond the limits of your body to deal with it. Most of what we deal with in people who are chronically ill are chronic weaknesses in the body's system that are allowing for accumulation of metals and other toxins within the body and within the cells. I'm actually not going to talk about mercury today because I'm tired of mercury. I'm done. We have this saying at my house like, "I am so done with mercury."

Let's talk about something else. If you came here for mercury talk and you're upset, just let me know and I'll just start talking about mercury and you'll feel a little better. Really, I want to talk about the things that I've been into recently which is how do you turn up these natural processes in the body and what are the different nutraceuticals that we use and what are they doing? If you get these sick people that can't take anything, you give them little bits of this and that and they have Herxheimer reactions. What's a Herxheimer reaction? I'm detoxing too fast or I'm killing my Lyme and I'm getting sick. A lot of these, they're just toxic from the substance you're giving them because the chemo protective mechanisms that are stress response mechanisms are broken themselves.

I'm going to present to you detoxification in terms of the chemical aspects of it that happened in the cell and what we call drainage aspects, how you filter out your fluids. Hey, here's a mercury slide. There's mercury stuff. It's only our first slide and we're already back to mercury. This starts to lay out a framework for us on how we're all different. You're here and you're probably aware that we're all different in terms of what we express, both the genes that we've inherited but then epigenetically, which genes we're expressing at any one time and what dictates what genes get expressed in any one time. There is a number of things that dictate that but in the end, we all end up with different rates of detoxification.

This slide was from a poisoning that happened in Iraq in 1973. On the X axis here, you have the biological half-life in days ranging from 40 to 100 days and then the frequency of the population. This is a classic histogram that's showing detoxification rates in these people and their variations. Over here on the left, you have … A half-life is a time from a peak level of a toxin in the blood to a half-peak level. Over here, we have 40 days. Those are the fast detoxifiers. In the middle, we're running around 60 days. This is for metal mercury. That's your average detoxifier. You run over here to the slow detoxifiers at 100. Now, of course, I'm ignoring this bar over here and it's a very big bar. You have a very classic histogram of population there but then you have this probably genetic subset of very slow detoxifiers out at 120 days.

Most of the time, if you're running a practice and you have people coming to you with some sort of chronic toxicity issue, they're this group, the slow and super slow detoxifiers and there's a combination of everybody's into snips these days. What are

your snips? “Oh, I’ve got a snip for this or a snip for that.” MTHFR. What do people call MTHFRs? I won’t make you say it. I won’t say it either but are you one of them? I certainly am. Oh, my God. We’re going to die of a 677 double mutant. That’s the death sentence, right? 35% of Mexico is 677 double mutants. 50% of China, I forget the number. There’s a lot of people with that and they are right. There’s a point at which the whole system starts going down and you start having changes and the body starts to get a little bit more down into the buck and having a lot of problems.

Those aren’t really the snips that are happening. These are functional expressions. Sometimes, you talk about epigenetics. I’ll talk at the end about specific epigenetics actually blocking expression of your detox chains but then there’s the sort of selective expression based on what kind of situation your body’s in. Your membranes are making a lot of decisions on what genes you express. This is a big Bruce Lipton thing, that the nucleus wasn’t the most important thing. The membrane was the most important thing because if the membrane was healthy and the membrane read a space around it that was clean, it opted to express genes that were maybe a little bit more of a luxury like cleanup genes. When you’re not in a stressed situation, you’re not in a survival situation, you can start cleaning up your milieu.

Functional expression, and the biggest one with detoxification is inflammation. I’ll show a couple of slides about inflammation and detoxification essentially being on a teeter-totter like this because detoxification is part of your antioxidant system. Inflammation is part of dominantly pro-oxidant system. Inflammation is when something comes in to eat you and you respond to kill it with pro-oxidants. You’re making bleach. You’re making peroxides. You’re making peroxyl radicals. Those are all pro-oxidants. When you’re doing that, you’re turning down detoxification necessarily which means then, when you’re in chronic inflammation, you’re in chronic toxin retention. That’s a big takeaway here.

One of the slides, and I have a couple slides in the beginning to just frame all of this and what are the big points and then we’ll dig in a little bit deeper and then, I’ll run out of time and I’ll scramble through the last couple of slides. This is a really good slide because I was teaching the principles of this slide for about three years before I found it. It really nicely summed everything up. This speaks a lot about the idea of what the body burden is and what toxicity really means because people always come to me because we have this lab, we do this fancy testing and they say, “Oh, I want you to test me and tell me if I’m toxic.”

What do I say to them? A toxicologist might appreciate this. I say, “Well, if you just stand with me for five, six minutes and talk to me, I’ll tell you a lot more about how toxic you are than if I measure you,” because we’re not in acute situations. We’re in chronic situations so the question is how much are these toxins affecting you. It’s easy to pick out especially with dentists. In this very important experiment, these are cell culture experiments and they were testing cells. They had mutated all these cells from this fish that’s really easy to work on. They made cell cultures and they were looking for a cell type that was resistant to cadmium. They found a cell that could swim in cadmium. Then, they found it could also swim in mercury and arsenic.

Cadmium, mercury and arsenic, those are big three to remember because they're slaves to the glutathione system. If you want to get rid of any of those, upregulate your glutathione system.

They found these cells that could swim in all these mercury, cadmium and arsenic. Then, what they do is they take them apart and they look at what the chemistry inside of them is so they can understand what made it so good in that situation. They found that there was three main things happening. These are the three pillars I teach with mercury detoxification. One was that it had a lot of glutathione biosynthesis. It made a lot of glutathione. The second was that it had high activity of glutathione S-transferase. If we make an analogy that we're in a cell here and these are cellular proteins and we have a mercury bound on to the cellular protein and we want it to come off, the glutathione swims by and the mercury doesn't just jump off onto the glutathione. It needs the transferase. It needs a catalysis catalyzing that transfer.

Then, that's going to pull that mercury off of that protein. Now, we have a mercury-glutathione conjugate swimming around here and we have to get rid of it. We have a bouncer at the door called the MRP. It's a transport protein that goes through the membrane and moves these toxin conjugates out of a cell. In this experiment, these cells are able to conjugate, ship away, conjugate, ship away, conjugate, ship away, push away, push away, push away from the cells before the metals would hit the targets that created the toxic response. Now, when they knocked out any one of those, the transferase, the glutathione synthesis or the transporters, not knocked it out totally but just turned it back down to a normal level, the cells lost that immunity to the metal.

Now, in that petri dish, what we would call the burden, the bio burden, the body burden of those metals never changed. When the detox mechanisms were working over time, the cells did not have a toxic response to the five micromolar cadmium that was in there but if they turn down that ability to push away all the time, the mercury got to the sensitive sites and created a toxic response and killed the cells. It's not just that we need to get the body burden down. We need to get the defense up.

Now, at the same time that you push the defense up, you will push the body burden down because detoxification in the body is a microcosm, macrocosm thing. We need to get it out of the cell and from the cell, it goes to circulation, blood, lymph and then we need to filter the circulation. There's two parts, the cellular detoxification and then what used to be called in the European biomedical world, drainage. It was lavage in France. You have drainage remedies. My mother-in-law, she's French and she looks at me like I'm crazy with all this stuff but she will go out and she'll get these little ampules of artichoke extract because she needs some drainage because that's in her culture. The sublingual nanoliposomes are not in the French culture yet. Soon.

A side point on upregulating the glutathione system is that when you do this, obviously, we're turning up your natural mechanisms but glutathione isn't there just to move mercury out of your body or mercury, cadmium and arsenic or any of the dozens of other toxins that it conjugates to and moves out. It's a big regulator of a lot

of things in the body. It's the main antioxidant. The ratio between oxidized and reduced glutathione is setting the redox tone in your cells which is sending the, really creating the step points for proliferation versus differentiation.

When you have high oxidized glutathione, you're sending out stress responses. Our decisions on which genes to invoke were left to a survival mechanism. In fact, there's a lot of really good work now looking at cancers dropping back to a survival set point that's easier … It's a way that cell can live that's easier to survive in when it doesn't have a lot of good environment around it but glutathione strongly controls the levels of Th1, Th2 responses to your immune system. That's innate and acquired immunity.

This was a study where they took this mice and fed him a liquid ethanol diet. It's a good thing I have a glutathione company. The liquid ethanol diet plummeted their glutathione levels. Now, that's not on this graph. What's on here is interferon versus IO4. Interferon is your main antiviral. It's a killer. It kills the invaders in the intracellular space. The interferon drops to nil and IO4 which is more of a hypersensitivity or an allergic reaction goes way up. When the glutathione goes down, you start hosting viruses. You've got herpes 1 through 30 just sort of wandering through your system and you don't touch them but you're rejecting all of your food. You're becoming intolerant of things that are coming in. Bringing up your glutathione system is not just detoxification. It's normalizing a lot of functions including the immune system.

Now, I wish this is a little bit more clear to you. I'm going to set up a slide that we'll use a couple times through here as we talk about these aspects of detoxification. This is the movement, this is set up to attract the movement of a toxin out of the cell through circulation into the liver, GI tract or into urinary excretion. You have phases of detoxification and these are happening inside the cell. You've got transport moving out. You've got phases happening here, here and here. I believe, if I'm not wrong, I'm going to go through each of those. It'll be a little bit easier to understand.

I just said that detoxification, we can think of it in two parts, cellular detoxification. Remember that conjugation of the toxin on the glutathione and shipping it out. There's other things you can use to conjugate, the sulfate groups or glucuronic acid. There's methyl groups. There's glycine but the main ones are glutathione, glucuronic acid and sulfate. That's cellular detoxification. Then, you go into circulation and you need to filter it out of circulation. That's going to be the kidney, the liver, the GI tract and also, Bern, the skin. You've been talking about this on us. There we go, kidney, liver, GI, skin. The most classical drainage remedies are kidney, liver, lymph for lymph movement and then GI is definitely one of them. It's just treated as a laxative thing, moving the bowel. We move toxins into circulation, then we have to remove them from circulation with kidney, liver, GI or skin.

The interface in between cellular and drainage is the cell membrane. The health of the cell membrane is a crucial, crucial thing. I'd already brought up Bruce Lipton and his discussion of the membrane reading the extracellular environment which is the extracellular matrix. I have t-shirts at home that say, "I love the extracellular matrix."

You got to be into German biological medicine to have a t-shirt like that. In German biological medicine, they treat the matrix. A lot of European medicine, they treat the matrix more than they treat the cell. Let's look at it from that perspective now.

The matrix, we used to think of it as just this amorphous gel that was outside of the cells but it's actually this hyper ordered ray. Now, you've got these big ropes of collagen going through there and then you've got this antenna like rays that are different proteoglycan complexes. At the end of those rays are these things called weak acids or carboxyl groups. They have to be de-proteinated which means the pH has to be high. When people talk about alkalizing, alkalizing is a matrix phenomena. Acidification of the matrix causes these fibers to lose their charge and they start collapsing upon themselves. It's like frying an egg and it gets all solid. We think about blood feeding cells like somehow, the blood feeds right into the cell but the blood has to bring things in the capillaries. Nutrients, then have to travel out of the capillaries through the matrix to the cell and always has to leave from the cell to the matrix to then diffuse into the blood. The proper ordering of this is essential. T

he best work I've seen are what acupuncture does away from the energetics of Chinese medicine and one of the physiological responses from acupuncture is done by the guys at the universities in Germany that do all the German biological medicine, Alfred Pischinger's book, The Ground Substance Matrix and Regulation, I think named something like that, they described all of the events that happen in the matrix after a needle stick. Interestingly, for those of you who swears of acupuncture and Japanese acupuncture where they use very fine needles, they determined that the most radical responses and the responses move through the whole body. Those responses, there's only one organ that covers everything and it's the extracellular matrix. It is connected head to toe. The whole thing is connected. They see these cascading changes go through there.

You got Bill Tiller who's working on looking at hyper ordering of different ion channels to the extracellular matrix. That's where all the energy medicine works. I already talked about the acupuncture. Back to the Japanese thing, they found the most dynamic reaction came from the smallest needles. The Japanese use really small needles. The matrix is crucial. The idea of drainage is mostly a cleaning of the matrix. The idea of our fasts and our cleanses is mostly a cleaning of the matrix and the membrane is that part that mediates between the two.

We talk about mediation being the membrane deciding how healthy is the ocean it swims in and then, what genes will I express but also all those transport proteins. For the transport proteins to work, to actively transport nutrients in and actively transport toxins out, they need fluidity of the membrane. There can't be damage to the membrane. You need an adequate supply of essential phospholipids and that is going to allow the fluidity of the membrane because all those transport proteins actually make little changes to their confirmation that allow the movement in and out. They need that fluidity. You can't have oxidatively damaged membranes. You need to be rebuilding those all the time. Incidentally, the best way to get the highest

source of phosphatidylcholine is raw egg yolks. That's a great, easy way to go. You can buy my micellized phosphatidylcholine but raw egg yolks.

Then, cutting to the chase of how we turn on the detoxification genes, there is something called the Nrf2 which is that little, the Nrf ball, the Nrf2. This I sin the cell. The circle there is the nucleus. Outside of the nucleus, you've got the Nrf2 held in place by the kip1. Certain enzyme inducers change the confirmation of that protein and the Nrf ball goes into the nucleus. When it does that, it stimulates transcription of all of the genes that have a certain promoter region called the antioxidant response element. Obviously, it's in response to oxidative stress. Now, a key here, and it's hard to read this. You have to be into this thing but you have these two things called SHes in there. Those are sulfhydryls. Those are reduced sulfur groups and in the changing confirmation, they're oxidized to disulfides. It is actually oxidative stress that creates this reaction and that goes in there and turns on the stress response. Then, you remove whatever is causing this stress response.

What if those systems aren't working? Here's a paper, a review of the evidence that ochratoxin is an Nrf2 inhibitor. Ochratoxin, one of the worst of the mold toxins is well-known for its nephrotoxicity and renal carcinogenicity. It blows out your kidneys. It blows out a lot of things. It epigenetically blocks the Nrf2 so your stress response doesn't work. I was discussing with Bern earlier all of these really difficult patients, they come into you, they're so sick. You give them your magic potions for detoxifying them and they get sicker. What do we do? Quite often, we make up a story and we say, "Well, see, it's a Herxheimer reaction because you're just detoxing too fast." Wrong. I just poisoned you with the thing that I gave you because all the things that we use for detoxification, say, lipoic acid. Is lipoic acid an antioxidant? Say something.

Female: Yes.

Dr. Shade: No. It's pro-oxidant. See, you knew I was going to do that so you don't want to say anything but how about green tea extract? That's an antioxidant, right? It's pro-oxidant. The way that those things work, because they're well-known inducers of Nrf2, very well-known, yet I have to oxidize this to get that to go in there. They actually create little free radical cascades in your cells and they're gentle little free radical cascades. You turn up your response and you clear them away because you have to detoxify that excessive lipoic acid. In the course of that, you also get rid of some cadmium, some mercury, some other toxins but if that switch is broken, I just gave you a pro-oxidant.

One of our mutual friends called me up the other day and he said, "I just almost killed someone. She's still in the hospital." I said, "What did you give her?" He said, "It was a lipoic acid IV." These are often awesome. Who's … Burton Berkson. Burt Berkson does these a lot on cancer and has phenomenal success. Like all these guys, they never talk about the ones that crashed and burned but Steve Hines told me this woman crashed and burned. I said, "Did she have mold exposure?" He said, "Oh, Jesus. She came to me from the head mold guy out in the southeast. She had massive mold toxin. We were trying to move it out of her liver." I said, "Well, there's no way to do it. You gave

her this massive free radical cascade and all of her capillaries opened up. She was just like oozing blood through her whole body."

That's a bummer. It explains why all the mold toxic people are everything toxic. We used to say, "Oh, yeah. Mold and mercury, they go together because when your glutathione system is running too low, you don't detoxify either of those." Then, when you look deeper into it and the mold toxins are actually blocking your ability to detoxify all those. Having given to you that bad news, you better hope by the end of this talk, I have some way to reverse that. I always say the first half of the talk is Old Testament. It's all bad news. The good comes later.

Epigenetics, who cares? This is just a pretty thing of genes but you stick a whole bunch of methyl groups on and you take the histone tails off and it shuts the gene down. It stops being transcribed. In fact, that whole body of literature of looking at this hypermethylation of different stuff, a lot of it traces back to prostate cancer. In prostate cancer, they were sure that this was related to glutathione s-transferase snips. Then, they look at all these guys that read all their genes and there's no relationship whatsoever to what your GST snips are. Some people gave up on it and the persistent people said, "No, there's got to be."

They went right after the tumors themselves or the precursors to the tumors are called PIN lesions and they found in those areas, the genes for glutathione s-transferase were hypermethylated, meaning they were shut off. There was no activity of glutathione s-transferase. Then, if you're like you've been tracking this stuff for a long time, remember Dietrich Klinghardt used to say there's a toxin at the heart of every tumor. They may analyze all these tumors and they had all these toxins in them. Then, they said, "Well, the toxin created the tumor." If neoplasticity, the development of tumor shuts off detoxification mechanisms in that area, then they become magnets for toxins, accumulators of toxins. Often, we see a clinical thing but we don't understand really the mechanism of it.

Let's move to talking about these phases here. Detoxification, the reactions of detoxification are described in phases. There's phase one, phase two, phase three. Phase one is, let me shift to the next. Phase one could be described in activation, making something reactive. Phase two is conjugation, linking it together with something to make it soluble and transportable. Phase three is then that transport out of the system. Now, phase three is big control point. In the phase one, the cytochrome P450 system, there's dozens of cytochromes. Then, you go to phase two and there's a handful but the transport out, there's really only one. There's one door out of the game. It's a very big control point for everything. If you block transport, and those are in the membranes, then you block all of the different reactions of stream from it.

I had mentioned phase one is known as the cytochrome P450 system predominantly and this is preparing a toxin for conjugation in phase two. It's essentially creating a free radical out of the toxin. Notoriously, it makes the toxin more toxic than it was. Now, for metals, there's no phase one reactions because metals are already ready to

go. They're already reactive but things like PCBs that were made to be non-reactive, we got to get them out so we have to turn them into free radicals. There's a great story in breast cancer and hormones about phase one not being matched to phase three where certain cytochromes turned estrogen into a radical. It's actually called a quinone. It's a highly reactive estrogen quinone which abstracts DNA based pairs and creates mutations.

In people with cancer, they will measure very high amounts of estrogen, DNA adducts coming out in the urine or people with just high risk factors for breast cancer. Then, they found that was true for prostate cancer as well. They're growing from there. It's very important to have phase one coupled to phase two so when you make that quinone, immediately, it's linked to glutathione or glucuronic acid or for estrogen, there's a repair cycle that could bring it back called nitro-quinone oxidized, something like that. Those are all phase two reactions. A lot of this work was done at Johns Hopkins and they thought about, "We got to make a drug to fix this." I found that nutraceuticals did that, nutraceuticals that upregulate phase two through, say, that Nrf2 mechanism will do that.

Phase two is that conjugation ability. Of course, they find in the snip world, people with snips for glutathione s-transferase tend to accumulate more mercury. They tend to have allergies to things like thermerasol. Thermerasol that was in vaccines, they used to use that as an antimicrobial and they'd wipe stuff down with it. The nurses who got rashes tend to have GST issues. Phase three then is the transport out. There's a bunch of different names they've given this over the years but the main names that you'll see now, the MRPs which stands for multidrug resistance proteins. They were discovered originally and the first, the Japanese group that looked at them called them glutathione s-conjugate transporters but then the drug companies were trying to figure out why some people are resistant to chemotherapies and they have over activity of this transporter, pumping out the chemotherapies from their cell. They called them multidrug resistance transporters.

Erroneously, people used to talk about phases of hepatic detoxification as if the liver was the only place that you did this. These detoxification reactions have to happen everywhere but you have multiple copies of that chemistry in the liver because the liver does the lion's share of the detoxification. It is present everywhere. Of course, you have more of it in your excretory areas so the liver, the intestines, then the kidneys in terms of how much of this chemistry. It's not like one cell, one set of transporters. You might have multiple ones.

Now, to look at it more in a engineering-like schematic, I should put a big, pretty membrane right here so that we see that up here, we're within a cell and after that, we're moving out of a cell. In these phases, you've got phase one that activation, the free radical generation moving into phase two where you conjugate the toxin with glutathione, sulfate or glucuronic acid and then that transport protein that dumps you from the cell to the blood. Of course, after my speech about the extracellular matrix, you know that it goes from the cell to the matrix, then to the blood.

From the blood, then we're in circulation. Now, we need to filter the circulating fluids and that is done through the liver. There's an active transport that brings the conjugate from the blood into the hepatocyte and then dumps it from the hepatocyte into the gallbladder, into the bile ducts and through that into the small intestine. You also have a movement from the blood through the kidneys and transport it out through the kidneys. I'm important to note that in the kidneys, this is not glomerular filtration. This is active transport in the proximal tubules. They're active so you've got in a nephron, you've got the filtration area where the first urine is coming out and then it's moving through the proximal tubules and you have active transporters in the tubules that move toxins in and also scavenge stuff that you're trying to save.

There's our more holistic picture. You can't really see there but there's the extracellular matrix. You can't see on this woman but those are not blood vessels. Those are lymphatic vessels. Remember, moving lymph is very important. Phase one and two in the cell, phase three, moving it out into circulation, phase three, pulling it into the liver. Phase one and two have been happening in the liver, filtering and cleaning the portal blood supply and then phase three, going out to the bile into the GI tract. You have transporters feeding the GI tract directly from the blood. Then, you have that movement of toxins out to the proximal tubules in the kidneys.

I had mentioned that detoxification was part of an antioxidant system. It's broader than that. I call it the antioxidant-detoxification-protein repair super system. In this super system, at the core are the things that we think about as antioxidant, lipoic acid, glutathione, vitamin C, vitamin E. Now, all of these things including glutathione … Glutathione is a true antioxidant but if you want it to quench hydrogen peroxide or a lipid peroxide, it doesn't do that spontaneously. It only does it through the action of an enzyme like glutathione peroxidase. Vitamin C only quenches free radicals through ascorbate peroxidase. Once it's done that, it's then oxidized. We don't want to build up the oxidized forms. The oxidized forms have a negative effect on us and so we need to reduce them and move them back into the reduced pool. We have enzymes called reductases for that. There's the hydroascorbate reductase. There's glutathione reductase.

We oxidize proteins and we want to reduce them with glutathione. We use glutaredoxin or we use thioredoxin. These are very important things that control … They're almost like on/off switches for proteins. There's a lot of active sites of proteins that could be turned on or off by glutaredoxin. Quite often, if you're under stress, strong oxidative stress, you'll actually cover up sensitive proteins with glutathione. You'll link glutathione onto protect them from being damaged any further. Then, once the coast is clear and everything gets good again, you move the glutathione off and reactivate that protein. There's a lot on/off switch that's happening there. Again, when you're in a stressed situation, you turn off a lot of your health cleaning proteins in favor of just survival.

Now, the mitochondria have a distinct set of all these enzymes. Inside the mitochondria is a slightly different isoform of those enzymes because they have to live in the mitochondria. The mitochondria are where all the burning of the fuel takes

place. There could be some collateral damage from little bursts of reactive oxygen species. They have to make enzymes that can handle the burst of oxygen but the tradeoff is that they become more susceptible to damage by mercury, cadmium and arsenic which explains why chronic metal toxicity leads to fatigue. Mitochondrial dysfunction and fatigue are hallmarks of chronic toxicity.

Last part of our super system is the ones that we talked about. Down here, those are the linking enzymes that link the toxin together with our biomolecules and up there, the transporters to take them out. Where do you find all the literature for this? This is all developed in the cancer journals. The removal of the free radical generating offender was how it's termed. Now, when's the last time you walked into an oncologist and he talked about detox? Nonetheless, this is where it all comes from. That Nrf2 thing, that came from mutation research. You can go into carcinogenesis. You can go into any one of the cancer research journals. The nice things about the cancer research journals is they're open access, most of them because they've gotten so much public money to do things.

Now, we go back to our slide here. Now, we've talked about a lot of these reactions. The main ones for the metals, remember you got up glutathione, you got up the linking together and you got up the shipping out. If you're doing that all the time, you can handle being in a toxic world. You don't need to be toxin-free if your cells can adequately keep them away from the inside of the cell. Healthy membranes is something I'd like to emphasize. I've brought them up multiple times, feeding the membranes so that the membranes can catalyze its movement inside and out. Phosphatidylcholine is the basic, the main building block, the main of the phospholipids that goes into having a good fluidic membrane.

Now, I'm digging the Weston Price type nutrition. I think you need a lot of saturated fats but if you have too many saturated fats, you will have a overly rigid membrane. Getting phosphatidylcholine from soy lecithin or sunflower lecithin will bring you more fluidic membrane. There's a lot of work in different vegetable oils now, the parent essential oils will lead to a more fluidic membrane as well. A couple of pictures of membranes and things that are going on, these are transporters, transporters that move things in or transporters that move things out all go through a membrane. They all have little pulsing. They're opening and closing in these movements. They need a fluidic membrane around them to support them.

You look at like proton motive force making ATP. You need a membrane that can support a big electric potential across it. It cannot be damaged and leaking. It needs to be intact. All of the energy generation in the mitochondria are through healthy membranes. Damaged membranes lead to leaking of the electron transport chain creating free radical stress instead of energy. The endoplasmic reticulum is nothing but a big folded over membrane, boom, boom, boom, boom, boom, boom, boom, boom, boom.

If you look at hormone transformation charts how things move from cholesterol down into all of your steroidal hormones, 80% of the reactions are in the endoplasmic

reticulum. I remember the first time I did good phosphatidylcholine therapy, I did lots of injectable-grade PC and it was just like a flush of hormonal energy. That was really, I was like, "Why do I feel so damn good?" I felt damn good. God, my testosterone must be higher right now and I saw all these transformations take place on membranes.

In the brain, all of these synapse reactions are taking place, all the neurotransmitters are taking place in membranes. These are the transporters in the hepatocytes that move … It's hard for you to read all these things but these are all different movements in and out of the hepatocyte and then everything moving down into the bile canaliculus to drain out through the bile. There's the MRP2, the MDR1. These are the different toxin conjugates going into the bile.

Having the membrane and the transporters work is super important for getting rid of the toxins but what also happens when the membrane doesn't work, you kill the live cells. The other thing that they're transporting into the bile flow is bile and bile salts. When you have cholestasis, meaning you're failing to produce and move bile, that means that your transporters are failing to move things into the bile. Then, you have liver injury because the bile salts, when they build up into the hepatocyte are acutely toxic.

These are the transport proteins, a simplification of the transport proteins in the proximal tubules. Here would be the urine and there's the blood and you have things moving in and out. There's MRP2 taking conjugated toxins into the urine while at the same time, you're scavenging things like amino acids. There's one of Bern's favorite, alpha-ketoglutarate being scavenged and brought back in. A more realistic picture is all these different transporters moving in the proximal tubule, moving things into the lumen into the urinary flow and moving amino acids and electrolytes back into the blood. When that's damaged, you lose a significant amount of control not just on detoxification but on how you scavenge nutrients. Now, our picture involves membranes and transporters at the cell level, at the liver level and at the proximal tubule level. How do we block things? Where are we at here? You wanted me to talk for three hours or four? Five. Bern says five.

Male: We have about 25 minutes.

Dr. Shade: Twenty-five minutes? Kidding? I only got through the first 10 slides. We'll have to speed up here. I got the idea too.

Male: Thirty minutes.

Dr. Shade: Twenty-six. Thirty minutes. Now, we want to talk about how things get blocked. I already told you about the inflammation thing, turning things up and down and I'll just show you one piece of data on that. You'll never be able to read that. They injected endotoxin into rats. Endotoxin are little parts of bacteria that get into circulation. When they get into circulation, they evoke an acute inflammatory response. Now, it's important to see what happens here because there's a lot of ways

that we can get endotoxin into circulation. The most common these days is leaky gut. When you have damaged to the barrier of the GI tract, you move endotoxin into circulation.

Here's what happens. This is transcription of the RNA for the detoxification genes and it goes 60% down in the duodenum, jejunum, ileum colon. Your GI detox system turns way down. In the liver, everything here, these are all different pathways in the liver. They all get turned down except for this guy right here. It's called the MRP3. That goes from the hepatocyte back into circulation to carry things to the kidney to be excreted in the kidney. Now, the significance of that is when you have a GI upset, if you have food poisoning, your detoxification through the liver into the GI tract turns way down and you shunt over to the kidneys. Now, that's fine for a certain amount of time but eventually, you're going to cause damage to those transporters in the proximal tubules.

Now, let's see with inflammation this schematic of how that's all working. We're in the cell. We got phase one, phase two to transport out in the normal intestine but then, when we inflame the intestine, there's a strong downturn in the activity of that liver to GI tract movement. When that happens, then there becomes a negative feedback inhibition on phase two activity. If you can't move out the conjugates that you made in phase two, you're going to turn down that linking activity. Now, unfortunately, nobody tells phase one to turn down. Phase two and three seem to have feedback controls on one another but phase one seems to come from some other evolutionary pathway. What happens then is you turn on creating free radicals out of your toxins.

The buildup of toxins turns up phase one but the inflammation can turn down two and three. That sets you into that situation where you've got inflammation toxin retention and internal free radical generation. That's a picture of chronic disease. I already told you in the story of breast cancer, that is a picture if you have the cytochromes to make a lot of estrogen free radicals where you're going to head yourself towards breast cancer.

The lipopolysaccharides, I've been talking about this for a while. I found this great paper from 1992. This was showing … Just read the … Here are the title, Concurrent Inflammation as a Determinant of Susceptibility to Toxicity from Xenobiotic Agents. Concurrent Inflammation as a Determinant of Susceptibility to Toxicity from Xenobiotics. Remember, the load doesn't determine the toxicity. The situation does. I just showed you that lipopolysaccharides are turning down detoxification. As you turn that down, the toxins are hitting the active sites. They have the schematic through time … What do we have going on here? I can't even read these.

GI disturbance. Boom. You loosen up all those tight junctions, you get lipopolysaccharides into circulation. Alcohol, a little bit of a wild weekend. You're disturbing those tight junctions. You're lowering your glutathione and you have, boom, you have lipopolysaccharides in there. This was a operation, I think, the UTI infection. You have these pulses of susceptibility during these periods of high

endotoxin in circulation. If you concurrently have high exposure, you're going to have a much more serious issue.

In a normally functioning world, we're going through the liver. We're going through the kidney but then we go to that situation where we block that liver to GI track movement and then we shunt the extra load over to the kidneys. Now, that's cool for a while but eventually, we're going to burn out the kidney ability to detoxify especially if there's a lot of endotoxin in the situation. No, just to show you the data on that in mouse models, they were looking at here, augmentation of mercury induced nephrotoxicity by endotoxin. Here, you have serum urea nitrogen as a measure of kidney damage. Here's your control, there's the mercury. Mercury is known to be nephrotoxic, can cause kidney damage through free radical stress.

Here's lipopolysaccharide alone. It does nothing compared to controls. Now, you put equal amounts of the lipopolysaccharide and the mercury together, there's the damage you get. They're synergistically toxic. What happens then to the ability? Over here on the right, you have urinary mercury. Mercury alone, you have high mercury in the urine. Mercury and lipopolysaccharides, you have low mercury in the urine. That's good, right, low mercury in the urine? Good. Good answer. Where did it go? Here's mercury in the whole mouse, mercury alone, mercury plus lipopolysaccharides. You then have toxin retention. The classical, toxicological method of looking at the urine to see if you've been exposed to mercury fails completely.

Those were transporters in the proximal tubules that were supposed to be moving the mercury into circulation and they've been strongly damaged. When we don't have any … I'm not talking about testing today but when we do mercury testing, we test your blood and your urine and we separate different forms of mercury so we can see the form that goes into urine, inorganic mercury. We see that specifically in the blood.

If the proximal tubules are working, the urine to blood ratio should be a pretty fixed level for everybody. It's about seven to one but in the sicker people, you see that gets strongly skewed and the urinary output is almost nil but the blood levels had gotten very high because you blocked the drain. There's almost always an infection that has to be treated to fix that. Sometimes, it's just a GI infection. Sometimes, it's systemic because it was the toxin and the endotoxin together that were creating the damage.

How do we initiate our anti-inflammatory response from inside the body? This is back to the Nrf2 upregulations, phyto genomics. Phyto being plants regulating what genes are being expressed and certain phytochemicals upregulate phase two reactions as well as intracellular antioxidants. We sometimes call that the anti-inflammatory cascade. The main groups of chemicals that do that are polyphenolic antioxidants like the green tea extract, pomegranate extract, pine bark extract and sulfur compounds like you'd have in alliums like garlic and onions or in the whole broccoli family. One of the more famous ones is sulforaphane.

Now, we're finding, pro-oxidants do it too. How does that all come together? I think I already told you but let's go over it all again. There is that mechanism I was talking about. The Nrf2 goes in and all the chemoprotective genes, the big master switch for chemoprotection all comes up at once. It does it to an oxidation of that switch there. We've got our friend green tea, we've got our friend pomegranate. Usually, there's a picture of the Buddha, the Medicine Buddha at that point. There's his hand, this little blue hand. That Medicine Buddha is holding a bowl of a long life elixir. I'm sure it's a liposome of some sort. I'm not really sure but I'd like to think it is but what's in his hand, I know, it's that plant.

It's called Terminalia chebula or Haritaki. It's one of the best polyphenol sources anywhere. It's all through Ayurvedic medicine. It's known as the king of herbs in Tibet medicine. It's used to regenerate the intestinal epithelia in Chinese medicine and you can't see those pictures because we don't have the resolution but all the things that you'll find in green tea and pine bark, all the great polyphenols are in there.

One of the cool things that's been going on with studies done in mice is they start aging the mice and they'll expose young versus old mice to something and see how they do. In this one, they were looking at antioxidant enzymes in young versus old mice and here's manganese superoxide dismutase, glutathione reductase, glutathione s-transferase, all going 35 to 50% low in the old rats. The robustness of this super system has gone down. Then, when they treat them with an aqueous extract of the Haritaki, all the old rats' numbers, the treated old rats go back to what the young rats were. Now, what about the young rats? Did the young rats go up 30%? Give me a guess.

Audience: No.

Dr. Shade: Great guess. Look, I don't want to go. Everything was good. Life was good as a young rat. Now, we're old rats, it sucks. We're wise by crippled. Sulfur compounds, all the same sort of stuff, vascular protective, anticarcinogenic but the sulfur chemicals were a little more prone to intolerance than the polyphenol. I used to use more polyphenols. The one sulfur compound I used the most is R-lipoic acid. Lipoic acid, and you'll go like, if you're into mercury stuff, you'll read all the Cutler stuff. He talks about it being a chelator. There are hundreds of articles on lipoic acid being Nrf2 upregulator of the highest order and being a glutathione system stimulant. It is specifically, the R form that gets into the Nrf2. The S form does not do it. It actually gets in the way. That's why R-lipoic acid is more potent. Those are different rotations. It's like D and L amino acids. You want L amino acids.

In the sulfur compounds, another thing you'll hear about sulfur compounds, people will say … Most of you have probably heard that garlic is good for mercury detox. You ever heard that? People say because it's a sulfur compound, right? They'll say it's because it's a chelator. Wrong. It's not a chelator. These are isothiocyanates. Thiols can chelate but these are not chelators. They're isothiocyanates and I'll tell you, they're pretty strong free radical generators, stronger than the polyphenols. Those are pro-oxidants. Now, what happens in a lot of the toxic people is that they tend to

have some combination of upregulation of CBS genes, cysta beta thionine synthase, which takes all these sulfur compounds and starts metabolizing them to sulfate but they get built up as sulfite. They get sulfite toxicity.

Sulfite oxidase takes sulfite to sulfate and it requires molybdenum as a co-factor. A lot of these people were taking garlic and going, “Oh, I’m hurting so bad. Wow, man, I can barely see.” I was one of them. I did it. I’d take straight sulforaphane. I’m, “Wow, it must be the detox.” It was sulfite toxicity and taking molybdenum totally got rid of the whole thing. When you’re doing the sulfur compounds, you got to make sure that you have adequate molybdenum.

Lipoic acid, we can really skip through that. I’ll do a couple things on that, very strong Nrf2 upregulator. It is a prescription for type 2 diabetes in Germany. It’s used for heavy metal toxicity, age-related decline in the antioxidant system. Remember the young rats, old rats? They did exactly the same thing with lipoic acid but lipoic acid is a twofer. Not only do you get Nrf2 upregulation, you get mitochondria biogenesis stimulation and more efficiency to the mitochondria.

Remember, we’ve got a lot of damage problems in the mitochondria and chronically ill and chronic toxic people so that’s one of the reasons that we love lipoic acid. This was age-related loss of glutathione synthesis, reversible with lipoic acid and then also increase metabolic rate because of the mitochondrial stimulation. Lipoic acid is … Bern was asking me at dinner, “What’s your favorite Nrf2 upregulator?” I was like, “Well, lipoic acid, very predictable, very standardized and you get mitochondrial and metabolic effects as well as Nrf2 upregulation.”

Ozone, antioxidant or pro-oxidant? Both. Pro-oxidant going in, stimulating Nrf2, generating an antioxidant response from your body unless of course we have mold toxins and we have epigenetically blown off that switch which is why some people do very badly with ozone. It’s the same sort of thing. This is from the ozone papers. What do they call it? Mild oxidative stress oxidizing the kip1 allowing the Nrf2 to go into the cells and create survival from a stressful situation. That’s just more of the same.

It might be a little esoteric but we’re also talking about dinner about ozone therapy and for a while, people were doing ozone and glutathione together. You ask a chemist like me or you ask Bern, we’ll say you can’t mix those two together. You’re going to destroy the glutathione. Doctors, they like a little mechanism but they’re really just like what works, what doesn’t. They’re like, “But we get great clinical results.” I’m like, “All right, let me think about it.”

Damaged glutathione is a potent upregulator of Nrf2. They’re saying, “Oh, I will give you glutathione and we’re doing the ozone and it’s just all great. Now, we’re giving you this twisted, beat-up, destroyed glutathione which is a stress switch and makes you respond by trying to fix it by turning up Nrf2.” That’s how that stuff works. It’s basically free radicals are doing this. Pro-oxidants or good pro-oxidants is in a rage. It’s like everybody’s like, “Well, you saw vitamin E. Everybody can so let’s do pro-oxidants now.” You got ASEA. You got ozone therapy and you got all these different

bleach-like things. They're acting as hermetic switches. Hormesis is a stress response, a little irritation and then there's a big bounce back. Now, our list of things that does it, we have the phytochemicals but really it was the radicals created by the phytochemicals. We've got reactive oxygen species, reactive nitrogen species, reactive sulfur species. These are damaged things cascading down and damaging this and your body says, "Whoop. Let's fix the mess."

Let's skip that or we'll never get through … Some good news. How do you clean the brain? Everybody says, "Make a chelator go into the brain and get stuff out." These are the capillaries at the blood brain barrier and stained in red is glutathione s-transferase, the linking enzyme and stained in green is the transporter, MRP2. In yellow is where they're collocated. Look at that. That's just like all lit up, meaning all the capillary system has an efflux pump, that blood brain barrier has an efflux pump there to reject stuff trying to come in and to move out stuff that's in there but then also remember that inflammation turns down all of those expressions. You get into things like autism. You've got chronic neuroinflammatory disorders. You get into people who have, you give them anything, they have a serious neurological response to it. They've got neuroinflammatory problems.

Nrf2 upregulation rules, two things you got to know. You got to have enough substance to do it. You don't trigger these things at small levels. You got to get it up to higher levels. Small levels right the ship and bring it from under-functioning to kind of normal but you can over-express it. You can get it up to two, 300% of its normal expressions. This was using St. John's work and this is the control that's a low … Let's go over here, control, low dose, moderate. It's a decent dose now or high dose, really high dose. At a really high dose, we have a 300% upregulation of the function of the transport protein but can we do that every day? Can we turn up the system to 300% of its normal functioning and just keep that going? No, there's time limitation on that.

Over here at that high dose, they got the 300 fold upregulation. This is over 30 days. It marches over 10 days up, up, up, up, up. Then, for the next 20 days of taking the same dose, it goes down, down, down, down, down until you've habituated to it and it stops upregulating. If you want to use these things to detox, you have to pulse. You want to start at low doses and titrate up to higher doses in pulses about a max of 10 days on. We start people at five days on, two days off and we move up to 10 days on, four days off.

Blockages, epigenetic blockage from mold toxins, from neoplastic changes. I'm sure it's happening. We haven't seen it yet but viruses. We know there's a lot of epigenetic changes from viruses but we haven't pinned it down to the kind of things that I'm talking about. The people with chronic Epstein-Barr definitely have this kind of blockages and need the kind of effects, the kind of turning around to those blockages that I'm going to talk about. There's the matrix in the membrane disintegration. We have to rebuild the membranes and have healthy membranes in order to be able to have the right chemical responses. I won't talk so much about this but this is when I was talking about neuroinflammatory responses.

Martin Pall has done a lot of work on nitric oxide, peroxynitrate free radicals. This is a hyper stimulation of glutamate receptors in the brain. In fact, the most well-documented neurotoxic effect of mercury is an exaggeration of the glutamate receptors which is why the most common neurological response to mercury is anxiety because you're just highly glutamate freaked out and then that moves into this free radical cascades. Then, you're foggy and anxious. Then, you're so foggy, you don't get anything done which makes you more anxious because you think you're going to lose your job. Then, you get depressed about it.

That all starts from having hypersensitivity in the glutamate receptors. Pall's contention is that chemical sensitivity all derives from these glutamate issues. However, looking back at the whole thing, what if there's epigenetic blocks on Nrf2 that are causing excessive free radical damage and you're not able to fix it and one of the downstream effects is this high glutamate sensitivity or over-expression of glutamate? We're back to the mold toxic thing. Membranes, they just blow through …

Male: We got 10 minutes.

Dr. Shade: Ten minutes?

Male: Ten more minutes and then 10 minutes of questions.

Dr. Shade: It's a good amount of time. Just to frame how we're going to design detoxification, we need to get that Nrf2 upregulation in the cells. We need healthy membranes to support all this activity and we need a clean matrix. Matrix, we talked about drainage of the extracellular matrix and we go, "What are the European remedies for this? They're bitters." In fact, we're releasing bitters real soon that has all of your liver drainage herbs like milk thistle, dandelion and gentian, has kidney drainage herbs like Solidago, corn soup, juniper and blood cleaning herbs like burdock but dandelion's also a blood cleaner and in Ayurvedic medicine, myrrh was the great blood cleaner. We have myrrh in there as well.

You can also think about alkalizing the terrain. The simplest way to go is just good water with bicarbonate. My favorite thing is isotonic sea minerals. There's a product called Original Quinton, Q-U-I-N-T-O-N. They also have a brand called QuintEssential. It's a French seawater from a very special place in between the zooplankton and the phytoplankton. It's got a very special phytonutrient plant along with the isotonic sea minerals and that was used … God, that was used for a hundred years to clean up the terrain. You need to upregulate the chemoprotective system. You need membranes and you need a clean matrix.

The membranes, I want to put this picture before and again, this is a hard one for you to see but the electron transport chain is moving through the inner membrane of the mitochondria. You're turning fuel into ATP and a little bit of free radical coming off of that. A little bit of free radical is good but when the membranes … You can't see the schematic here. It has all these damaged oxidized membranes. When the membranes

are damaged, the electron transport chain doesn't line up so well anymore and it leaks.

Now, instead of lots of ATP and a little bit of free radicals, you get a lot of free radicals and just a little bit of ATP. That's another significance of fixing the membranes, phosphatidylcholine therapy. You can get phosphatidylcholine from eggs, as I said, or you could go to really good nutraceutical sources, either pure … We have a pure phosphatidylcholine micelle or liposomal delivery of different nutrients like glutathione or vitamin C. If you have good liposomes, you're using high quality phosphatidylcholine and you're able to bring in the nutrients and the phospholipids at the same time.

I got the wrong slide in there because you'll never be able to read that. No, that will come up at the end. We'll look at it at the end. Let's skip to … Glutathione supplementation, we need to get glutathione in. Now, if everything was working great, your proteins will be made adequately into glutathione. If you want to just bump that up a little bit, you could put a little extra cysteine in there either as an acetylcysteine or cysteine or as whey protein but in the sixth situation, your enzymes aren't translating that into glutathione very well and so you need to get some glutathione in there.

For instance, with the ochratoxin that's turning off Nrf2, you get rid of that by conjugating it to glutathione but if you can't synthesize a lot of glutathione, you're going to have a hard time. There's IV glutathione but IV glutathione, you don't have transporters to bring glutathione from the blood into the cells very efficiently. Nebulized glutathione is interesting but more of a local action. It's excellent for chronic obstructive pulmonary disease and emphysema, different oxidative stress in the lungs. You got transdermal which has got some effect. Acetyl glutathione is a new one on the block that has higher uptake into the blood from the GI tract. It has a higher uptake in the cells. Then, you've got liposomes. Liposomes are the things that I obsess on and so that's my chosen way to get that in there.

I've showed you about a billion pictures of cell membranes because phospholipids were used as a therapy in Germany. They made Lipostabil which is an injectable-grade phospholipid and it had phenomenal data on reversing fatty liver disease, changing coronary arterial problems, changing hyperlipidemia, changing neurological problems. It was really a phenomenal useful thing. This is all just by normalizing membrane function. Those phospholipids can be put together into these things called liposomes where you create a little cell. That's a lipid bilayer. They're spontaneously formed when the lipids are injected into aqueous solutions. If your aqueous solution has vitamin C in it or glutathione in it, it gets trapped inside that liposome.

Now, crucial to making a good liposome, you need to make a very small one that will observe rapidly. I've got a couple of slides of that later. They found that the ability to get into a cell of a liposome was vastly better than a regular nutrient itself. This was done on your local, Jin, ReadiSorb is out of Palo Alto. That's a liposomal glutathione. This was done in neuronal cell cultures where they diminished the glutathione till the

cells were about to die and they saw how much IV versus liposomal glutathione they had to put into the culture to bring the glutathione levels back up. You needed over 100 times more plain glutathione which is what you get in an IV than you did liposomal because liposomes are able to fuse with the cell membranes and you take the phospholipids into the cell membranes and you get a much higher efficiency of delivery of any compound that's brought in with that.

Now, I'm going to skip that one there because it's a little, has a lot going on in there. Let me see. We talked about epigenetic blockage, how do we reverse epigenetic blockage. The best data right now is on the nutraceutical diindolylmethane, DIM. People know DIM is the estrogen metabolite thing preventing harmful estrogens, keeping beneficial estrogens but it turns out that … I'll just skip to this one quick. Epigenetic modifications of Nrf2 by diindolylmethane and this was in prostate tumors, they found that the prostate tumors are epigenetically modified and turned off Nrf2 and DIM was able to reverse that.

I started using this maybe six months ago, a year ago. I took all my weirdest, hardest cases, the ones you give them the good stuff, they feel better, then they crash, they feel better, then they crash or they just feel bad right away. We started giving them DIM first and we're able to get them onto a significant therapy really, really quickly. Some of these people were mold toxic. Epstein-Barr was one of them. I don't think this woman had mold toxicity but she definitely had chronic Epstein-Barr that would just come and go and come and go. She used to be a professional athlete and she was totally wiped out a week on DIM and she was back working out. It just changed everything. This is done in a nanoparticle that has extremely high absorption. I don't know if you're doing it in capsules, how high of a dose? We're doing 20 milligrams twice a day, 20 to 25 milligrams twice a day in a nanoparticle and we're able to do that pretty quick.

In the therapy approach of removing the blockage, one, we're going to use DIM for the epigenetic repair. We're going to use something for the matrix. I mentioned the isotonic sea minerals. They're one of my favorite but you're also going to want exercise, water, alkalizing minerals and bicarbonate to fix the matrix, phosphatidylcholine for rebuilding the membranes and vitamin C is also for repairing the matrix.

The fibroblasts that build the matrix use vitamin C as a co-factor. It's absolutely required. That's why scurvy, you start getting bleed of the lips because you stop making the matrix in the gums. You'll also get free radical control and a gentle detoxification. Now, if you're using a high quality liposomal vitamin C, you've got both the phosphatidylcholine and the C together. I mentioned CoQ10 here for restoring mitochondrial integrity. Once we get past the initial blocks, we could bring in lipoic acid too but the CoQ10 can bring the energy up without creating the detoxification stresses.

Male: [inaudible 01:21:06]

Dr. Shade: Yeah. We're pretty close to the end here. I'm going to skip the neuroinflammatory thing and go then … Once you've laid the groundwork, membrane, matrix, epigenetic block, now we want Nrf2 upregulation. Now, we're going to need a lot of B complex vitamins because you're using those in your detoxification. Now, you can start using glutathione without having negative effects. Now, you can use your Nrf2 upregulators like lipoic acid and the polyphenols. Now, you can use the stronger drainage formula.

Some of the really sick people, you can't even give them … I used to use a lot of … There's one place called Soluna Labs. They make really good, what do they call this, spagyric tinctures. It's a mix between an herbal and a homeopathic but a lot of the really sick people couldn't even handle those. We had to use total homeopathics but now, they can use … The herbs were big toxic to them. Once we stopped that block, now we can use more intense drainage formulas and we're going to keep up the PC, C and CoQ10.

Just a little pitch for what we … We just released a new line. I have a couple brochures of it here. PurXpressions is a direct to consumer line that we make. We also have Quicksilver Scientific which is our doctors' line. This one is a more at these epigenetic changes. There's a nanoparticle diindolylmethane. There's a liposomal C. There's a nanoparticle CoQ10 and a liposomal B complex. You can go online. We just released this line at [inaudible 01:22:55] which I just flew in this morning from another conference. I got to fly out tomorrow at 6 AM to go back there. I only did this because I already crossed paths with Susan once before and had to cancel so I knew she would try to kill me either physically or psychically if I didn't show up so I did come. She heroically wrote the article that apparently I was supposed to write but this just missed me.

All these things are liposomes that we do. Just what you got to know about liposomes to work, they got to be really small. They got to be so small, you'll absorb them right to the oral cavity because once they get to the GI tract, the bile changes them so you want once that you can absorb sublingually and this has been used in the pharmaceutical industry. They make liposomes all the time and they're making them all in this small 50 to 100 nanometer range. This is uptake in the cells versus sizes. We're going from 200 to 150 to 100 nanometers. If you track these white bars, that's getting into the cell. It's only when you get down 70, that's 60, 50 nanometers, that's when you get really fast uptake. That's what we size things as the same way that the pharmaceutical companies do. That was just some sizing stuff.

All the things that you need for that blockage removal are in the PurXpressions line and the hardcore detoxification line is the Quicksilver line. You could go onto our website. You can get more information about all of that but with that, let's just wrap it up. Just one note, we did put everything together into something called the Detox Qube that you can get through doctors. That has a protocol for titrating up, pulsing on and off, bringing in all the aspects of Nrf2 upregulation along with toxin binding in the GI tract that we didn't talk about. Let's end it there and take questions.

Male: Great. Thank you. Thank you, Dr. Shade. Questions, one over here.

Female: Would you want to have the mercury or the testing done first before you even look at that Qube for treatment or is it something that's just-

Dr. Shade: There's chemical and there's clinical indications for where you're at. The testing is great and it's a great roadmap especially if you see urine to blood ratios are off. That means that you've got damage to the proximal tubules. Those are the hardest people to detox, usually means that there's an underlying infection that you have to address. The testing is great roadmap but you still need a good clinician to make some decisions about where you're at. You're going to try … The intra doses of the Qube are pretty low, pretty easy to deal with. You're going to test the waters a little bit. If it's hard for you, you might have to back off and do some other work first. Of course, bringing in the DIM ahead of time is going to erase a lot of difficulty there.

Female: For about how long do you need to do it?

Dr. Shade: We're a little new to this but it seems to act pretty quick. You're going to do it along with the other things probably for about two months. Even at conferences I go to, these people come up to me and they're like, "No way. I can't touch any of this stuff." There's one guy, just saw it and says, "I can't even hold your bottles. They're too strong for me." I got him to take the DIM. Within a day and a half, I had him on everything. It happened pretty quickly but I'd say, at the very least, give two weeks of DIM would be safe and then start on the others and you're going to titrate them up and keep the DIM going at least two months.

Male: Another clinician question. I've been ill for about half my life … I'm getting fairly old here. I've been doing the box work already. This sounds so complicated in a way so I'm wondering how important it is that I find someone who really understands your system and can work pretty carefully with me on …

Dr. Shade: Yeah. The sicker you are, the more you need a detailed guidance. I would-

Male: How would I go about them …

Dr. Shade: You can contact Quicksilver Scientific. You'll find our website. There's a phone number there. You can call and ask who we know in your area that you can work with. There's also consult services and even if you got a doctor that doesn't know the system real well, they can call in. We have a professional pharmacist that works for us and does our doctor outreach. If he ever runs into problems, he comes to me but he knows the system up and down now. He'll work with your doctor.

Male: Thanks.

Male: Any other question?

Female: Hi. I was wondering if you are able to reset the mitochondria, if you've noticed that would have any helpful effect towards any kind of dementia.

Dr. Shade: It definitely should. It depends what the extent of the damage is. There's a lot of stuff that are going to go into dementia. If you detoxify and reset the mitochondria, you have a great shot at reversing a lot of it but some is very really long-term and there's almost scarring going on in the brain. It's hard to fix.

Female: I'm sorry. I should be more specific. I'm thinking particularly of the issues with glucose not being able to be used.

Dr. Shade: Yeah, that's type 3 diabetes where you've got insulin resistance in the brain and that'll definitely work for that but the real trick while you're doing that is put them on a MCT, high MCT diet. Use that ketone bodies as fuel. You'll definitely be able to work with that.

Male: We have time for one more quick question.

Male: Can you use the indole-3, the I3C?

Dr. Shade: Yeah. Orally, if you're using capsules, indole-3-carbinol turns into DIM in the stomach acid but if you're doing a nanoparticle that's bypassing all that, you have to start with diindolylmethane. Indole-3-carbinol is actually kind of cytotoxic. Eat your broccoli, not too much broccoli.

Dr. Shade: Eat your broccoli.

Male: Great. Let's thank Dr. Shade one more time. If you have further questions, we're going to take a 10-minute break. If you have further questions, feel free to come down and ask him here. We'll resume again at 9:00. We'll be back then. Thank you.