THE SPECTRUM OF HEALTH
PODCAST

Podcast Session #75

Deuterium and Infectious Disease

With Dr. Laszlo Boros and Dr. Petra Dorfsman

For more, visit www.laszlogboros.com and www.drpetrad.com

Dr. Christine Schaffner: Hi, everyone. Welcome to the Spectrum of Health podcast. I'm Dr. Christine Schaffner, and I wanted to introduce to you a series I did earlier this year called The Luminary Talks. I invited my colleagues, my mentors and my friends to give us lectures and inspirational information during this very paradigm-shifting time, where I feel there's a huge opportunity to reframe how we look at medicine and illness, and empower each other. So I hope that you take this journey and learn from these inspired luminaries and enjoy the series.

0:00:40 CS: How are you both doing? Hi, Laszlo, good to see you.

0:00:43 Dr. Laszlo Boros: Hi, how are you? Nice seeing you again.

0:00:47 CS: I'm grateful for both of your time. My community is learning more and more about this topic, and obviously you all know this the best, and so I'm just excited to continue to educate and share, especially right now. We need more information to feel empowered right now, right?

0:01:05 LB: We just got a big endorsement by the Wall Street Journal.

0:01:08 CS: Oh, awesome.

0:01:11 LB: My professor friends, we've been criticizing conventional medicine for a long time, and based on our work, the Wall Street Journal is running a piece about conventional medicine, how useless it is for situations like this, and the Wall Street Journal names one of my co-authors of our paper and also our group in this field.

0:01:45 CS: Yes, I keep on thinking about the silver lining, right? People want more information for sure, it's definitely hard to get the truth out there, given the state of our media right now, but I do feel like especially in our community and the communities that you all belong to, there's more openness to hearing the truth. I'm trying to hold on to that.

0:02:14 Dr. Petra Dorsfman: Yes, that's all we can do.

0:02:17 CS: Well, we're really grateful for you to do all this. When people hear these things, they just don't understand how much science there is to explain the mechanism of action, it's not just this conspiracy theory or esoteric idea, there's the work that you do and what you'll share today. I hope people can hear it and see it and then make an opinion.

0:02:41 LB: I don't think Red Cross cared much about whatever Fauci was saying.

0:02:49 CS: Should that be a bumper sticker?

[laughter]

0:02:50 LB: Yes, listen, I need a mitochondria, they have their own biochemistry and physiology set of rules and those have to be obeyed, those have to be obeyed by human beings who are setting up certain guidelines and policies.

0:03:13 CS: Absolutely, absolutely. Well, I want to thank everyone who is joining us live. I'm just so honored and grateful that my friends, Dr. Petra

Dorsfman and Dr. Laszlo Boros, are here today to talk about deuterium, and how this is a really important concept that I want our community to be more and more educated about, because it's something that we look at as a foundation for health, and it can increase resiliency in our immune system and in our body. We're really going to talk about how deuterium relates to infectious disease in this time of Covid. I feel so blessed, I have all these wonderful friends who are really amazing experts. You are in front of two wonderful experts who have been doing this work with deutenomics and deuterium. I just want to thank you both for being here. If you don't know about Petra and Laszlo, Dr. Petra is a naturopathic doctor who practices deutenomic medicine in West LA, and Dr. Boros is a professor of Pediatrics, Endocrinology and Metabolism at UCLA. So, welcome.

0:04:23 PD: Thank you.

0:04:25 LB: Thank you.

0:04:25 CS: Well, let's dive in. I know you all have been putting a lot of great information out there. If this is the first time any of you all have heard about deuterium, we'll send more information in the replay so you can get up to speed, but we're going to just go under the assumption that you've heard about this topic and you have some understanding of what deuterium is. So Petra, why don't we just jump in. Why are we talking about deuterium right now and its role in our susceptibility to viral infections? Can you share a little bit about how deuterium affects our susceptibility to viral infections and how it may affect our immune systems?

0:05:05 PD: Absolutely. So there really appear to be four determinants for this particular pandemic that we're currently seeing, and I would argue that at the time, one is the deuterium load of the individual. A second one is the temperature and the humidity that we find ourselves in in current environments, and then the abnormal electromagnetic conditions as well, as a third, and then the fourth seems to be the air pollution. So deuterium load is something that is really causing metabolic crowding, and deuterium itself is a growth factor for all microbial infections, including viruses. So the higher the excess levels are in our tissues, the more likely it is that we will become a very good host for the viruses. That is how it relates to the current immune system dysfunction that we're seeing.

0:06:29 CS: I know this is still basic information, but for people out there wondering, how are we exposed to deuterium, and how does our system become overwhelmed with deuterium?

0:06:45 PD: It's all over our food and water supply. We are living lifestyles that do not allow us to excrete the excess levels, and tissue levels start to rise, and this is causing this mitochondrial dysfunction. And of course, Dr. Boros can tell you a lot better, perhaps.

0:07:09 CS: Yes, and in my simple brain, I wonder, how I would share this with patients. I've said that deuterium is naturally occurring, but modern life has created an excess of exposure and also an inability or a decreased ability for humans to deplete deuterium, so we're all carrying around more deuterium than nature intended. That has all of this host of consequences that have been both of your life's work. So thank you for that, Petra. And then Dr. Bo-

ros, can you talk about that mechanism by which EMFs play a role in the reported low levels of oxygen that Covid patients present with? I think this is a really important topic. There's a lot of circulating information about how EMFs or 5G might be a important factor to think about here. Please share your wisdom with us.

0:07:58 LB: I'm not the technology guy, I'm studying this as a biochemist. If you look at a red blood cell, which carries oxygen, I think this is common knowledge, we have these big molecules in our red blood cells, called hemoglobin, and it has a functional group called porphyrin, which has iron in it. That is the binding site for oxygen and metabolites. I'll explain this a little bit better. Iron, as a metal, can be magnetized, and everybody knows this because we saw magnets before, so those are actually metals, iron mostly. And because of the free electrons of iron, they respond to electromagnetic resonance. It's an old publication, and there's many other follow-up studies showing that actually, hemoglobin, the molecule carrying oxygen in our red blood cells and in our blood, behaves as an electromagnetic component. Actually, there are papers discussing how they are becoming electromagnetic components as part of our biological system. Yet, if you look at these frequency ranges, then you can see that, for example, if you go from 10 GHz to 140 GHz, the magnetic field, if iron has free electrons, actually increases by fivefold.

0:09:40 LB: So, these are historic papers that we can point out and the audience can look at those papers directly. But what we think is, after all, because of iron's capacity of binding oxygen, binding carbon dioxide, there's also a very interesting intriguing metabolite in the red blood cells, that is called 1,2

bio-phosphoglycerol, it actually binds to and occupies the binding site of oxygen and carbon dioxide, when there is no compound to carry there. It's actually a metabolic kind of fingerprint of how much glucose there is in plasma and how much oxygen has to be dropped off at the tissue level to increase deuterium depletion, because sugar or glucose is high in deuterium. So red blood cells actually measure this to an intermediate metabolite. It's a mutase enzyme that actually converts bio-phosphoglycerol into this red blood cell-bound metabolite. So, looking at these binding states, when oxygen, carbon dioxide, and this bio-phosphoglycerol change place, electrons become free and iron can get magnetized, based on the electromagnetic resonance, which is described in the literature.

0:11:15 LB: So, if you look at various types of electromagnetic resonance, we have to look at how they affect metals in general in our body, which can be magnetized, and also how they affect iron-binding capacities. The other interesting aspect of this scenario is that in our mitochondria, Complex IV or cytochrome c oxidase actually has four iron atoms that are in vicinity besides other metals, so it is a very responsive enzyme system to an electromagnetic field. Clinicians need to look at some of this basic biochemical information and basic ferromagnetic resonance type of information to see how oxygen-binding capacity will change in a certain electromagnetic environment.

0:12:15 LB: And again, I'm not an engineer guy, so you have to do your math, but practically, this is something that, as a basic biochemistry type of argument, you have to look at to see if there's any clinical outcome that can be improved by looking at these scenarios. And this is for clinicians who asked us for help, to explain device-related oxygen carrying this capacity or

for help with compromised patients, because they report an oxygen deficiency, there's no oxygen carrying capacities, it's like a high-altitude disease, and there are many other kinds of clinical links and scenarios that we can actually bring into this argument.

0:13:00 LB: Now, I'm just focusing on base electromagnetic resonance, because those iron or metals respond to these, so oxygen-carrying capacities are actually very dependent on iron's impact, that magnetic behavior, so these need to be extended into the clinics just to see how we can improve patients' lives simply looking at the oxygen carrying capacity based on iron magnetism and electromagnetic fields.

0:13:30 CS: Thank you for explaining that. I agree, all the points that you just shared make the case that we really need to be looking at this and studying this more. And especially, when we think about EMF, I always reference how the iPhone came out in 2007, and here we are in 2020, and just look at how our electromagnetic environment has changed rapidly over the last two decades. How can we not think that this is a potential factor in our health and, as you say, basically our body's ability to deliver oxygen to our tissues. I think you made a lot of great points which lead into the controversy here. What we're all seeing is that patients who are diagnosed with Covid in the hospital, they're put on ventilators, and unfortunately, that has a very poor outcome. Can you further explain why you think that ventilators are probably not the best option to treat these patients?

0:14:33 LB: So, positive pressure ventilation is done under heavy sedation, because the patient has a tube in the trachea. And when you positively pump pressure into the lungs, there are type I haemocytes, these are more like

cells, like a balloon, and they actually exchange oxygen between air and red blood cells. And they are very tiny layers of cells. They formulate almost the entire surface of the alveoli, which participate in lungs and gas exchange. Now, there are other type of cells that protect this very delicate oxygen exchanging in carbon dioxide. Carbon dioxide exchanges in cells simply because they produce a surfactant which is more like a detergent that keeps these alveoli open while you're breathing under negative and positive control, because of your breathing movements.

0:15:42 LB: Now, positive pressure ventilation destroys the cells that actually produce the surfactant. It's called bronchopulmonary dysplasia. We studied this with colleagues at UCLA, and we published papers which we're going to make available. But practically, the cells that assist and protect these alveoli cells, they transdifferentiate, they become muscle cells, and they try to protect the airways and the alveoli. And as a result of it, there's going to be a blockage in the oxygen-delivery process. And also, the lungs can actually collapse under negative pressure because of lack of surfactant. And the third problem, which I think is very significant, besides the physical damage delivered to the lungs if oxygen and ventilation is lasting too long, especially with high pressures and high oxygen, is that these patients are in a trans-parenteral nutrition protocol, which is TPN. Their gut flora practically dies out, because there's no food to digest, they have no sustances to collect deuterium...

0:16:58 LB: And I have to add bacteria and viruses, they need deuterium as one of their requirements, as Dr. Dorsfman was mentioning this, and the gut microbiome performs some of these functions very efficiently. If the gut micro-

biome is inefficient in collecting deuterium from food, bacteria die. They cannot deplete deuterium for circulating intermediates like lactic acid, which are blood exchangers, with the microbiome. And as a result of that, we cannot produce low-deuterium ketogenic, or ketone bodies like propionic acid, that is reabsorbed into circulation to deliver energy to muscle cells. And because of the lack of these deuterium depleting scenarios in the gut, eventually, because of TPN protocols, these patients eventually are not able to deplete deuterium, and more nanomotors in the mitochondria will break down. Oxygen is not available as efficiently, and the food has hydrogen, because usually TPN protocols are carbohydrate and protein heavy. That means that they have high deuterium content.

0:18:12 LB: And so these scenarios just add almost like a chain of events that is really hard to address clinically at every stage, so this is like in medical biochemistry type of argument, including the gut microbiome, and looking at all these clinical procedures that are related to ventilation or artificial ventilation, positive-pressure ventilation, because of this bronchopulmonary dysplasia, because of the nutrients in glyphosate which may bind to the red blood cells, or biphosphoglycerol binds, because of their structural similarities, and usually, these are industry-processed food that are high in deuterium. And also, they are provided in TPN protocols, to the best of my knowledge, all these scenarios line up and eventually put these patients in a very difficult clinical situation. And this is why we're addressing these issues with clinicians who are asking for help right now, because they don't really know why these patients become desaturated so rapidly, so easily. And why is it so hard to saturate them? And why do they need artificial ventilation or positive pressure ventilation, and then 80% to 90% of these patients die. So it's really hard to

imagine why a protocol would enforce or would put in place medical procedures while the death rate is 80%.

0:19:55 LB: I am a scientist, a teacher, I don't practice medicine, so this is not medical advice, this is just addressing some of the clinical issues that are brought to our attention. So, I really don't know why these procedures are in place, it's not my job to judge these policies. But practically, if you look at the medical and biochemistry point of view, they don't really make much sense, if you hear me out. From what we know as biochemists, it's really hard to understand why these procedures are in place. We are not, again, criticizing anybody, it's not my job to set those policies, but if we have doctors and physicians who have questions in these directions or anybody who is listening to this podcast, we are very happy to elaborate on this.

0:20:56 CS: Yes, it's this perfect storm, right? When you go to the hospital and you're in that situation and then, as you said, a chain of event starts, where it's almost impossible for the patient to expect a recovery at that point in time, which is heartbreaking from my standpoint. Have you all contemplated what the protocols or procedures should be? How we should be responding, given everything that you know? I know there are these videos circulating from an ER doctor talking about this looking like altitude sickness and really oxygenating the patients rather than ventilation, but do you have any opinions on that at this point?

0:21:41 LB: Well, I can't make treatment recommendations, and I won't, but I'm very happy to talk.

0:21:49 CS: Theoretical.

0:21:51 LB: Well, you actually have more clinical experience. I don't have that much clinical experience, even though I work with clinicians on a regular basis, I just solve their problems, as a biochemist.

0:22:06 PD: I do not work with critical care or acute-care patients, but what we've learned from the endless webinars that have been available is that oxygen therapy should be first before anything else, and all sorts of oxygen therapies, by the way, so whether that's hyperbaric oxygen, ozone or just a breathing mask. Those are all the basic places to start.

0:22:41 LB: Well, in the meantime, deuterium depletion through IV's or drinking water or fluid would be also logical from the biochemistry point of view. I think that should be the first thing to start, to actually address some of the comorbidities--diabetes, hematocrit syndrome, those comorbidities may be deuterium related in the first place. So when we look at obesity, high blood pressure, cancer, neurodegenerative diseases, you may see deuterium depletion in the first place happen in the acute clinical scenario, and also in the underlying diseases that put these patients in a more difficult situation simply because they already have diabetes. Diabetes with high circulating glucose provides more of this biphosphoglycerol metabolite that binds to red blood cells, so oxygen cannot occupy its binding site as easily.

0:24:02 LB: So being a patient desaturated is a number of factors working in this advantage of like carrying oxygen from lungs to tissues, and if you address those through nutrition, through metabolism, through biochemistry, deuterium depletion should be one of the first interventions that we may con-

sider, simply to include muscle pressure, tissue mitochondrial functions, because water is very critical in mitochondrial functions, and oxygen is needed, and hydrogen from food to make matrix water. And oxygen is not available, and in the meantime, the food is high in deuterium, you just break more mitochondria, which would deliver ATP for the peripheral cells. So multiple organ failure is a very critical, advanced scenario, which obviously may end up being in high mortality rates and during this ventilation process and the disease process simply because these factors are just like in a chain of events, they just make this oxygen delivery method of water production, deuterium depletion process very difficult, because deuterium breaks the nanomotors in mitochondria and also has some other disadvantages.

0:25:35 LB: In fact, matrix water cannot go to quantum destabilization of the protons, so water cannot be broken, and it's easy because the deuterium compromises these processes. This is very good information, so I'm just flashing them up so people hear about these and then they may start doing their own research regarding these scenarios. But I think this kind of interaction should start with clinicians, especially emergency doctors and also with naturopathic medicine, because they can actually start at least addressing the comorbidities.

0:26:16 PD: Absolutely, deuterium depletion is the place to start for everything.

0:26:20 CS: I appreciate you sharing all of that, Dr. Boros. I think a big goal of this talk is to give people another perspective and another lens to see what's going on, which you've done beautifully. And going a step further, Dr. Petra, can you talk a little bit about the 101 on deuterium depletion and how

you guide patients? How do we guide patients in being healthy during this time, through the lens of deuterium depletion?

0:26:54 PD: The first place to start is to consume fats and not sugars. That's a big one. All kinds of fats are important, but most important is that they are naturally derived from animals that have been grown sustainably, and vegetables that are not genetically modified. So all those, if that's grass-fed. Butter is excellent, and then you want to consume high-quality proteins, same situation, as natural as you can find, and then just non-starchy vegetables. That's a great place to start nutritionally.

0:27:41 LB: The liquids one consumes should be really guided by thirst, and we prefer filtered or spring water. And again, once the thirst comes up, sit with that for a little bit and allow your body to compensate for that, and then if you're still thirsty, go ahead and drink the water. Then there are the aspects of getting sunlight, which is very important. My new favorite one that I've been experiencing myself in the last six weeks being in this lockdown, is exercise on a regular basis and strength-training. And I think that's also very helpful. Sweating it out, that's great. Let's see what else is on my list. Having someone wash your back really well, scrub it well, there's great research on that.

0:28:43 LB: It's actually the sun-exposed skin areas, we can't actually scrub our skin to remove deuterium-loaded keratinocytes from our skin. So this is why, if you look at a nature movie in Africa, all the birds and other symbiotic fauna participants, they actually sit on the back of these animals which are exposed to sun mostly, and their skin and keratinocytes are also one way of getting rid of deuterium. And simply, this is why animals, they scratch their back at tree trunks, and they actually use all opportunities to scrape off their

keratinocytes. This is one of the mechanisms we believe is part of itching, just to actually deplete deuterium or actually get rid of deuterium through keratinocytes, which is actually the big surface type of approach to deuterium depletion, your skin surface is what is exposed to sun in normal conditions.

0:29:50 LB: So anything nutritionally or in the lifestyle that gets rid of dead tissue, anything that is getting rid of waste products, anything that is part of your normal gut flora, still is produced by the gut flora collecting deuterium from food. Anything that is naturally happening to you to deplete deuterium, that should be involved in your skin, your breathing, your exchange of vapor, and oxygen and carbon-dioxide in a normal or even a physiological fashion. Also, your food is very important, all these major body components--digestion, breathing, food intake and skin care. I'm talking about scrubbing, not necessarily putting oils and stuff on your skin, but that can also be an approach. I'm not big on supplements and stuff, and skin creams...I don't know those. We know what, what are in those.

0:31:08 LB: But practically anything that is comfortable, and you can actually relate to these very conventional, very general... And this is what the Washington Journal is giving us a big endorsement for, I put it on my Facebook page. I've been part of a group of professors. Some of them are from Mayo, from Johns Hopkins and so on. And actually, because of this Covid situation, our approach, which is more generalized, just like these very common rules that we mentioned and the protocols that we entertain in the last few years, seems to be now very valid and very influential as far as making decisions or recommendations to high policymakers. And this is why the Washington Journal just mentioned one of my articles. We're going to provide this information also for the audience so they can actually evaluate for themselves. But it

seems that general half measures, including all these body parts are very important to fight this virus and these pandemics.

0:32:34 PD: I just want to add, to turn off the mainstream media. That's another one of my suggestions, and make sure you laugh and love and sleep really well. Those are the other pieces that are definitely part of it.

0:32:48 CS: I love it. It's a lot of the foundational naturopathic principles that we know and trust well. I didn't know that connection of the deuterium depletion through the skin and the keratinocytes, so that is new to me, so that's wonderful. I know you all talk about this in other channels, but I just know some of my audience might be wanting to go a little bit deeper in individualizing deuterium depletion for themselves. Do you just assume everybody has high deuterium levels? How do you talk about testing or just even talking a little bit about deuterium-depleted water, and how you incorporate that into protocols? Do you mind touching on that a bit, Petra?

0:33:30 PD: I really design any type of protocol very personalized. So it depends on what someone presents with, what their health challenge is like, and based on their ability to afford the water and make it part of a protocol...We've done the deeper estimate of what their weight is, how much water they consume, and all of that. So that's how we design the protocol specifically for somebody. But all of the depleting mechanisms that we just talked about truly work for everyone. And it is a great place to start. I think most people can assume that their levels are too high, and that we should deplete, and you will know really quickly whether that has an effect for you because you will notice diminishing symptoms, you will hopefully increase your energy. There's a lot of pieces to this that are important.

0:34:36 CS: Yes, exactly what you shared. So these are great lifestyle tools for everyone. If you're really struggling with a chronic condition, going a step further will accelerate your body's ability to heal, and Petra does a lot of that work in her clinical practice. So if you want to dive deeper, please connect with her in that way. Petra, did you miss anything else you wanted to share about resiliency and our immune systems at this point? I feel like the most empowering message we all can share with our community is not to be afraid of the virus, but how do we trust our immune systems, and how do we strengthen our immune systems, with everything you just shared, of course? I just want to give you the opportunity before we move on to the next topic, if you have any other words of wisdom along those lines.

0:35:32 PD: I think I covered, really truly the most important pieces of it, and I think perhaps, the only other part, I would say, is trust your body to take care of it, to handle it, to be able to clear the viruses or the microbes that you come in contact with. If you truly adopt a lot of these lifestyle changes, you should be able to handle all of this and just function in society normally.

0:36:01 CS: We've collaborated on some patients whom I've seen, and when Petra becomes part of the team, I see how things shift for people, so I know this is powerful work. Dr. Boros, what can you add? We've touched on a lot, but from your medical biochemical words of wisdom, how can we stay virus-free during this time?

0:36:28 LB: Well, I don't think staying virus-free is the ultimate goal, but rather to protect the people who are more susceptible to the complications, as a result of a virus infection. Coronaviruses cause sinus infections, the cold in

general. There are about 60 different serotypes of coronaviruses. So our immune system, if we are, again, without comorbidities, and we have an intact immune system, this should not cause any major medical problem. And we know from epidemiological studies that every patient who has symptoms or "tests positive," not all the tests are good. Yet every person who shows symptoms of coronavirus, there are 85 other people who already survived and have no symptoms and antibodies. So they had the virus already and they fought them off without any problem.

0:37:41 LB: So really, truly, when you look at epidemics and pandemics, we have to consider what is the disease causing the morbidity, mortality, and what's the general infectious protocol that we need to consider? And this is why these particular recommendations by policymakers were put in place, simply because this virus seems to be very contagious, yet they did not know in advance that actually it's maybe like a flu kind of season, because there were no data to see how many people were affected, how many people developed complications, how many people showed symptoms, and how many people died. If you look at those numbers now, after two, four months into this epidemic, starting in December, now we are a lot smaller, and this is why there are controversial recommendations as the pandemic develops. Sometimes we need to wear masks, and then masks are not recommended, some experts say this, some expert say that. Clearly, the statistics show that this is really not an extremely dangerous virus. Maybe this is clinically and epidemiologically, it's matching a bad or even just an average flu season.

0:39:07 LB: Just look at Sweden and some other countries who have not done any lockdown--they are actually doing better than some of the states in the US. Populated states have different outcomes, simply because people

are more dense. States that didn't lock down entirely, they do maybe better almost, I would say.

0:39:42 LB: These are epidemiological data and evaluations, I'm not saying this because there's no supporting data. Stanford, they tested, even in California, where we live, we do know that the number of cases seem not to match the expected modeling, and we know the modeling, the basic modeling that set off these very draconic policies were actually false, and the guy who actually predicted them, I think he's already retiring from his position, and we all know about that.

0:40:17 PD: Yes, Neil Ferguson, he resigned earlier this week from Imperial College, but all of those models turned out to be incorrect.

0:40:26 LB: Well, what happened is, as I understand, he didn't even consider his own infection and exposure to the virus in quarantine centers, so he had visitors in the meantime. And for that reason, he had to resign from his position, and he was the main policymaker behind the recommendation. I would say it's really hard to understand what's happening without elaborating this further, but simply, as a biochemist, as somebody who teaches medical biochemistry at a college and edits newspaper articles, reads newspaper articles, I have a lot of information about their scientific or the clinical approach and the epidemiological approach and results. To me, it is more important to follow some general guidelines, follow recommendations from naturopathic doctors, obviously, your standard doctor is also very important to talk to, but all this information is very important, to have handy to make decisions for your own good, simply because the major media is not representing what's happening in real time.

0:41:51 LB: So as Dr. Dorfsman was saying, turn off your TV, I think that's the most important thing, and start looking at some deuterium-depleting protocols which will help your body to fight viral infections or bacterial infections which compromise your immune system. Practically, there are measures that you can do on your own once you turn your media off.

0:42:22 CS: Thank you for all of that. I think that's all wonderful advice, and in our community, I think, we're just always seeking out alternative views and trying to find the truth outside of the mainstream media, because you can't find it there. I appreciate you sharing all of this. I feel like this is a good place to take some questions. Is there anything else on your mind you want to share before we dive in?

0:42:55 CS: Okay so Petra, what is the difference between deuterium-depleted water and structured water, or are they mutually exclusive?

0:43:08 LB: Now we have to work on this together. This is the medical inorganic chemistry side. Structured water is part of your mitochondria water components. Water can bind to other water molecules, or it can bind to the surface that it's attached to. And once water is binding to the surface, then it becomes surface water or structured water. Because of hydrogen binding to surface water, on the surface, and hydrogen has more flexibility, and deuterium binds stronger to the surfaces. The water molecules that actually remain in a solvent, because you can actually look at this as water trying to dissolve the surface, it actually is deuterium-depleted.

0:44:00 LB: So one of the ways of the depleting deuterium is actually using the surface where actually deuterium has a higher binding capacity, and the free water molecules and higher layers which are not close to the surface, you can deplete it. Now, surface water and deuterium-depleted water, these are two different scenarios. Even though surface water, structured water may deplete deuterium in the free-moving layers, deuterium-depletion is a physical process, or deuterium discrimination is a biological process in our system, simply using some physical and inorganic chemistry-related principles. I don't want to go into details, but you can actually fractionate water, boil water and generate a water vapor which is less deuterium-heavy, meaning that deuterium remains in the solvent phase, and the vapor has less deuterium simply because deuterium has different physical-chemical characteristics. And this is why we have seasonal flu, and this is why these seasonal diseases appear at a certain cold time, because if our airways are cold, our mucosal cells in our mucus has more deuterium that is left in the mucus itself, as long as the airways are cold, because in cold water, deuterium fractionates harder, meaning that there is less deuterium in the vapor phase.

0:45:32 LB: So your mucosa has more deuterium and this is why bacteria and viruses and virus-hosting SAC and cells can actually host more bacteria and viruses, so they grow faster. This is why the seasonal flus either appear more towards the south hemisphere depending on where the cold weather is, simply because of this deuterium-fractionation process, but it's temperature-dependant after all.

0:46:04 LB: And it's a good question. Old waters can be structured, deuterium-depleted, and also regular environmental water. But their structuring of water may be pre-deuterium of the free-moving layer. Because these are

physical processes, they may interact, but one does not derive from the other directly.

0:46:30 CS: Thank you. We have a lot of patients with chronic sinus issues, and I'm just thinking deuterium depletion should play a huge role in covering that outside of the Covid world. So thank you for describing all of that. So this is just a little bit more detailed. "Does Mountain Valley water deplete deuterium?" Do you know the deuterium content amount in Mountain Valley water? Have you all looked at that?

0:46:57 PD: I think it's 140 PPM.

0:47:00 CS: And that would be considered...Is it 135 under...

0:47:04 PD: 125 and under.

0:47:07 CS: Okay.

0:47:07 PD: But it's lower than tap water, that's for sure. Most tap water's between 148 and 150.

0:47:15 CS: And then people are asking about links to the study, so I'm happy to share all of that in the replay and of course your websites. And Stephanie Seneff's on. So what is the connection to humidity? Hi, Stephanie. So Petra, you had mentioned, I think, humidity in the beginning, so any comments on humidity.

0:47:35 PD: Yeah, I mean, this relates really what Dr. Boros was just saying, about the ability of your body to fractionate the deuterium out, and in higher temperatures, we are going to be able to do that more effectively. And then humidity, how does that exactly...

0:47:52 LB: So the outside humidity or the environmental humidity is different of our airway's humidity, because our exhaled air has 100% humidity. So this is one way we actually get rid of water or vapor, particularly through the lungs. It's 100% humidity. That's what exhaled air is. Once we inhale air, then it depends on the environmental humidity. It can be lower. I guess not right now, we have about 20% humidity. So it's one of the ways of getting rid of deuterium, is practically through your body vapor or your exhaled air. Now, interestingly, the human air or the exhaled humidity has lower deuterium than the environmental deuterium. This is because it's coming from metabolic water, or at least it is part of our bodies to deplete deuterium to the gut, so whatever we absorb as far as nutrients and make water of it, it's already deuterium-depleted.

0:49:01 LB: So the human breath, under normal conditions, should be somewhere around 135 or lower, if you are actually consuming the right diet. Unfortunately, and Dr. Grossman can talk about this a little bit more, once we measure the deuterium content in breath, then in the general population, especially in California, because we are closer to the coast line, so the air humidity is about 155 PPM because the Atlantic Ocean is very close to here. And 155 PPM is what we have in the oceanic vapor close to the coast line. It's about 155. So practically, the dry air helps us to breathe out, and we don't want to breathe in deuterium...Have humidity, and humidity carries heat as well.

0:49:53 LB: So high temperature humidity is the best to get rid of virus infections or get rid of airway infections or deplete deuterium in your mucus and mucosal membranes. However, high humidity, especially the oceanic kind of coastline, may not be advantageous simply because of the high deuterium content in the air vapor. Again, these are scenarios that we have to put in and weigh which one is more important. And it's a big question from Dr. Seneff. And I know, because we work on this together, and we discuss these topics together. I think eventually we will have some kind of a common ground or we will develop some important scientific and clinical guidelines to actually transfer deutenomics to standard medicine and standard care. This is one of our goals of presenting and talking about these topics.

0:50:55 LB: Maybe a little bit more of a complicated biochemical context, but naturopathic doctors and you, yourself, who actually can translate this for the patient's understanding and important information delivered and discussed, obviously, that should be part of it. But the humidity, high temperature...that's why we have inhalation, that's why we recommend people with sinus infections to actually inhale hot steam, vapors and so on. You want to heat up your airways to get rid of the high-deuterium mucus, you actually increase your airway temperatures to make this fractionation more efficient in your airways, just like you produce deuterium-depleted water in laboratories--we actually use these evaporation process, we use heat and vacuum. So all those actually work in the same way in our airways. So simply, this is a very good question, but it's part of the deuterium fractionation process.

0:52:06 CS: Thank you. So the steam distillation and inhalation that will be in a lot of our naturopathic protocols, I'm going to start using that more with my

chronic sinus patients, so thank you, thank you. So a lot of questions about hydrogen water, hydrogen tablets, any comments on your opinion of hydrogen water and how that interacts with these concepts of deuterium depletion?

0:52:33 LB: This is an interesting topic, because from the biochemistry viewpoint or the biochemistry argument of hydrogen as a gas, is really not very stable especially in a biologically-surrounding environment simply because hydrogen gas and oxygen do not react in normal temperatures, like normal environmental temperatures. But once you get hydrogen gas in your body, because of the electron transport chain, which actually works like a spark plug in a car to activate oxygen, it would actually consume hydrogen gas very quickly in the form of water, producing peroxide or water, that's practically what our body does. This is how we actually generate, from a proton cloud, this is how we generate water.

0:53:33 LB: And because some physical processes produce hydrogen with lower deuterium, some arguments actually favor consuming hydrogen water or hydrogenated water or electrolyzed water. I'm not sure how technology is fitted to this process. From the medicine of biochemistry point of view, hydrogen gas is very short-lived in cells and also in biological systems simply because of the electron transport chain, and also because of the temperature conditions in the mitochondria which actually produce a lot of heat, simply because that's the job of mitochondria. And we actually use those proton channels, which are actually bypassing the ATP synthase nanomotors, which actually produce just food for the cells.

0:54:40 LB: There should be studies delivered just to rephrase these questions and provide answers. I think hydrogen water may be beneficial in some

conditions, I'm not saying it's good or bad, but hydrogen gas in any biological system is very short-lived. There are bacteria that produce hydrogen gas in our gut, but we know that's practically because of the ATPase or ATP-dependent proton pumps which actually pump protons from bacteria to retain deuterium, because deuterium is a growth factor for bacteria and virus forms in cells. So again, putting all these scenarios together, it may be good. I can't take a position and I won't take a position in that. I think as a gas form, especially in the presence of activated oxygen, it may be very short-lived.

0:55:40 CS: Thank you. I was very curious about your opinion around that, so thank you for that. So there's a couple other comments, with the role of sauna therapy, and also red or infrared lights therapy and deuterium depletion. Any feedback about that as a strategy to deplete deuterium?

0:56:04 PD: I think those are beneficial. Absolutely. As we know, sunlight is 40% infrared light, and so it can be very beneficial. And of course, be mindful for not burning and all of that, but in that same way, saunas are good because it makes you sweat, and so you can excrete in that way.

0:56:31 CS: Stephanie said a comment, "The hydrogen gas that is produced by bacteria is very low in deuterium, in part because the enzyme has a strong deuterium isotope effect."

0:56:43 LB: That's correct. So that's why I was saying that the deuterium content of these hydrogen gas products are low. Yet again, the question is how far they penetrate into the holes from the gut, simply because hydrogen is very reactive. It's actually called the exploding gas. If you remember in elementary school, the teacher would bring in a balloon with hydrogen collected

from water breaking through electrolysis, and using the spark, they actually ignited the balloon. And actually, the reaction took place in a matter of fraction of seconds, meaning that it actually exploded. That's why you had to do this experiment in the gym and that's why the teacher was holding this stick, with the spark, on a long stick, because it's very dangerous.

0:57:41 LB: And that's what happens in our body. And because of the electron transport chain which bacteria have and also epithelial and endothelial cells have, every passage of hydrogen gas through these cell compartments or electromagnetic fields, which are in the cells, very rapidly use up the hydrogen that is produced in the gut. It is very beneficial because it's low deuterium, and it may be protecting that epithelial or endothelial cells simply because they are in the vicinity. And we know that protection and protecting the epithelial cells of the gut is very important because of leaky gut syndrome. So, again, there might be very important common biochemistry arguments that we should actually line up with deuterium depletion, you just need to do those studies. And Dr. Seneff knows this very well because you are a scientist. Sure enough, I'm very happy to work on this because these are very important and interesting initiatives.

0:58:52 CS: Absolutely. All three of you in one room would be amazing to keep flushing those ideas out. I think one last question before we wrap up, is on the role of ozone and deuterium depletion. Do you guys feel comfortable talking about that or sharing any insights on ozone therapy and deuterium depletion?

0:59:15 PD: Well, I'll just briefly add my little part to that, is that one of our colleagues, Dr. Whitney, provides ozone ten pass therapy, and of course, this

is anecdotal, but we did a testing before and after treatments, and there was a reduction in deuterium. So it's an oxidative therapy that depletes deuterium. So that's my clinical part. I don't know if you have anything to add.

0:59:47 LB: I actually did argue a case with the California medical boards, that was related to Lyme, and ozone treatment was part of the scenario that was entertained in that argument, simply because ozone provides more oxygen at the tissue level, there's more metabolic water production in the capacity of cells, and mitochondria increase simply because of their oxygen's higher partial pressure. And as a result of that, ozone treatment has some mitochondria tissues that actually produce more deuterium-depleted metabolic water in case we consume the optimal diet, a ketogenic diet. Because ozone treatment per se does not introduce deuterium-depleted hydrogen gas just like the gut flora that Dr. Seneff was referring to.

1:00:44 LB: Ozone treatment only delivers the oxygen and water, and hydrogen still has to be obtained from food or some other ways. But yet, it's very important to provide enough oxygen, sufficient oxygen, in certain disease conditions. Chronic fatigue was obviously one of these scenarios, where ATP synthesis has been using capacities, and this is where the clinical benefits come--not my experience, but I do work with clinicians. But in fact, it helps with deuterium depletion only if you consume the appropriate ketogenic diet with a low-deuterium hydrogen source, and for that, these two technologies can compliment one another. But simply, you have to make some dietary considerations.

1:01:34 CS: The more I learn about deuterium and deuterium depletion, it makes me think about all the clinical tools that we've seen work with our patients, and reframe them in the lens of how do they affect deuterium, and is that one of the mechanisms that we've just underestimated over the years? So it's really fascinating.

1:01:54 CS: Well, I want to honor your time. I know you both are so busy, and we are beyond grateful for you all sharing your perspective and your knowledge and your wisdom today. If people want to find out more about both of you and your work, can you just share where they should go? We'll put it in the notes for the talk.

1:02:19 LB: I have a website. It's very easy. It's laszlogboros.com, and you can find additional information about deutenomics. Deutenomics is how nature deals with deuterium depletion. We call it medical deutenomics. And you are right, once you learn about deuterium depletion, a whole new kind of idea opens up simply because now you see a lot of these alternative approaches, oxygen or ketogenic diet or low-deuterium food, or improving your microbiome functions, could actually assist your patients and help them to be in the better shape and health.

1:03:08 PD: And my website is drpetrad.com, and that's where you can find my details.

1:03:14 CS: And you do consults online if people are in California, or anywhere in the world?

1:03:20 PD: Yes, I will do virtual consults with anyone in the world.

1:03:29 CS: Great.

1:03:32 LB: And I also can do consults.

1:03:32 CS: Well, I want to thank you both so much for your time. There was so much great information here today, so thank you both. I hope to see you both soon. When the world opens up again, and I can come down to California, I'd love to spend some time with you both, so thank you so much.

1:03:46 PD: Of course. Thank you.

1:03:48 LB: Thank you.

1:03:50 CS: Thanks, you all, and have a wonderful day.