Introduction and Ben's Background

Welcome back to the conversation. My next guest is an electrical engineer, homesteading Biohacker and the creator of H2Genesys molecular hydrogen generators.

Ben Tammetta found his way to hydrogen therapy by researching anti-aging therapies and experimenting with different biohacking techniques himself. Through his research, he found that a key to sustainable health is supporting mitochondria and how beneficial molecular hydrogen can be.

His mission now is to bring the powerful benefits of hydrogen therapy to as many people as possible, by making it accessible, affordable and sustainable.

Ben. Welcome. Thanks. Thanks for having me here, Jason. Appreciate it. Well, you know, I saw in your bio that you're an electrical engineer. You know, I came from the mechanical engineering world, so I'm kind of curious what?

You know, it's not the typical route for most electrical engineers that I know. They're stuck doing building design. And in other areas and and interesting things.

Usually boring stuff. Right. That's what engineers that we tend to be doing. So I'm curious, how did you kind of find your way from electrical engineering into the health world, longevity, mitochondria and then eventually molecular hydrogen.

Right, right. Yeah. Good. Good questions. Yeah. Me my I was like an engineer, you know, like we were very, you know, rigid. And I think if you want to understand things from the Koran and so in that's why I got into the electro engineering and at the same time I had a big interest in natural health.

And so, you know, devices with hydrogen that kind of bridged the gap and allow me to, you know, pull those both together and also to study hydrogen in the way that affects the body from a like an engineer perspective.

I want to know the working mechanism. I don't like these black logics or magic magic gadgets that you like these companies. I'm like, oh, this, do this and this will work.

But like, what's going on? You know, it's like a big mystery that, I mean, I can't operate like that. I need to understand the science as an engineer and researcher, you know, the relation and the correlation there.

But first of all, I, you know, some of the new people like what is, you know, hydrogen therapy, some people are new to this. They don't even know what it is.

And so the way I like to describe it is hydrogen. Hydrogen therapy is the administration of hydrogen gas, the infuse into the body through inhalation, drinking hydrogen infused water, or the diffusing of hydrogen through the skin by enclosing the area in a bag or sleeve.

And we've had great results doing that. So this is all for the purpose of faster healing and better overall health. And so, some people are, you know, for me, with a cannula.

So the inhalation part of it just breathe. Example some people call this oxygen right. Cannula over the years sits the base of nose. Cinch it up. And so that's how you'll be inhaling the hydrogen.

So it's very, you know innovative easy to use. You don't feel anything. So it's very, you know, practical. You know, you spice the other way. You know machines come you connected to, you know, diffuser stone.

Put that in some water. Let it let the hydrogen gas balloon to water for 15, 20 minutes. And then you drink it. Right. I don't have a bag or sleeve, but, you know, a sleeve, for example, would be pushed up over your shoulder, cinch down around your, say, bicep in your shoulder in that area would be bagged in the hydrogen.

Would, you know, you know, build up in that concentration, diffuse into your skin to promote faster healing. Like I said, we've had great results with that.

So those are the main uses we have. And then back to my story. Like we mentioned, you know I'm not a doctor, you know. So I offer a different perspective on this health healing and hydrogen stuff.

My academic background is as an electro engineer, you know, scientists and natural health enthusiasts for over 30 years now. And so I wanted to talk about the hydrogen therapy today and how I got into this and share some of the benefits that we've noticed.

And so my overall, you know, goal was to increase, increase healthspan and quality of life, you know, a semi-retired for a while. And and then once you're, you know, you start to age, you've got some money and can enjoy yourself.

Then your health starts to decline.

What Hydrogen Therapy Is

Said no, no, I can't let that happen. In my late 40s, I was starting to feel these effects. So if you know, so that aging just, you know, some of that fatigue energy brain just like just not having as much energy before.

And so, you know, as we age, we start to feel these effects of, you know, lack of energy fatigue, the cognitive decline more susceptible to sickness. I was getting sick a few times a year.

I didn't know why. And various other age related health conditions. So so the goal was, you know, overall health, you know, more energy, strength, better sleep, sharper mind, faster healing, reduce aches and pains in general, overall feeling of being more useful, you know, so you could just be more active and enjoy life more.

And so, you know, they say a healthy person has thousands of dreams, right? But a sick one only has one that's right. To get healthy. Yep. That's right.

Yeah. It's interesting. You know, so many tangents I could go down here with respect to engineering in the body and particularly electrical engineering.

You know, the deeper I got into the mechanisms of how the body works, you know, we we typically talk in terms of biochemistry. And that's fine because we have a lot of research.

We have a lot of understanding. You know, the biochemistry is is fundamental. And you can go a level deeper, which is what I found is that the the chemistry in the body is really primarily about donating electrons.

It's the flow of electrons in the body. And so, you know, and there's actually books written on this, you know, the body is electrical. Right. And so this starts to get into really interesting territories when you think about health, it's not to say that, you know, vitamin C and and vitamin B and sort of these biochemicals aren't beneficial.

We know they are. And we can get to more fundamental aspects of our biology. And this is to me where when I found out about hydrogen therapy, it kind of just instantly clicked.

This is like such a simple molecule, right? If you just go to the periodic table, like hydrogen is so fundamental and so simple, and yet it's so powerful and it works so amazingly well.

And I think to me, as I dig deeper into health, it's like these simple things that nature has provided seem to be so

universally beneficial. Right? I mean, just take water for example.

Right? Like clean, healthy water. Unbelievable. What it does with our biochemistry. So just give me the kind of a high level overview of what is it about hydrogen in its interaction with our biology that makes it so interesting and unique.

Right right right. Yeah. When Chris sit back, talk about how it works and how it integrates and stuff like that. Another interesting point that got me here is I'm studying carbon 60.

I was involved with longevity groups when we were doing biohacking and just getting in on the latest research and experiment on ourselves. And so one of the supplements I came across was the carbon 60, which is a very inert, stable molecule.

And so we started making it ourselves and found out that, hey, it's working, it's producing some of the anti-aging type benefits we're looking for. And then when I did more to design it, science said, why is this working?

There's no, you know, mechanism for why carbon 60 is used inside the body. And so I found an obscure paper that says, C60 was used for hydrogen storage.

It used in hydrogen cars. And I'm like, well, maybe it's the hydrogen that's producing these benefits. So and that being the case. So hydrogen is actually you know, the carbon six is actually acting as a transport mechanism for hydrogen to hold on to it inside the body when it's released and grab onto grab onto it and release it so it holds on just tight enough to make it available for the body and said, well, let's skip this expensive carbon 60 stuff that you have to, you know, you say purchase or make every, every month and we'll just focus on hydrogen.

And so that that led us to the, the hydrogen water bottles at the time, which were very crude because this was a while ago, and I did not notice the same effects as with the carbon 60.

And so if I the next question was, well, maybe it's in the dose. You say that, well, the poison is in the dose, right. Well, maybe the cure is in the dose.

So as an electro engineer, I end up killing my own generator hydrogen machine. And I so experience even better benefits. And so it turns out that, the water bottles and the tablets, you know, they're not so effective.

As for the effects, I was looking for myself to really just take a step back.

From Carbon 60 to Hydrogen Dosing

There's there's like a number of delivery mechanisms in the marketplace right now. And you can find them on Amazon. And there's, there's certain companies that'll sell these little hydrogen tablets that when you put them in water, it'll diffuse hydrogen into the water.

Right. But in my experience, you know, I played around with that. You know, I'd put one, one tablet in water. I drink it, you know, for a period of time, didn't really notice much.

And I needed to do some testing, some with some sort of functional test. Didn't really know as much. Then I put like 2 or 410, and I just couldn't really get any significant effects with those.

And I even had one of the personal water bottles that, you know, uses an electoral device to, to diffuse hydrogen in. And I found it just it it was hard to use, to be honest.

You had to clean it. There's cleaning issues, and it just didn't really produce the effects that I was seeing in the research and and on the anecdote that I'd heard about.

Right. So exactly right. Then it's like you go up to the bigger machines and this is kind of where the effects take

place. Right, right. And then when it's exactly what I, what I found is whether my research experiment with between with myself and clients and friends and associates.

But it turns out that hydrogen is natural to the body. And so the body in your in a healthy gut, which most people don't have nowadays, can produce as much as 6 to 12l of hydrogen gas per day.

And you can't dissolve a liter of hydrogen gas in a liter of water if you plan on drinking it. Right. It's just like physically impossible. And we found that the the optimum dose or from a machine to get the full benefits of maximum benefits is about one liter of total gas per minute.

So if that's combined hydrogen and oxygen gas, we're talking about, you know, 600 plus milliliters or 0.6 liters of hydrogen gas that is most beneficial for the body, which is like thousands of times probably more than with a tablet, you know, provided. Right.

Exactly as that. You're talking about thousands of times more. Because if you're getting a liter of total gas per minute over the course of 1 to 3 hours a day, you're talking like 100ml.

In some cases when you can't even you're getting like milliliters of hydrogen in dissolved into the water. So this actually blows away right. Like like a bottle is like, 30 or 40 bucks depending on where you buy of these tablets.

And so shouldn't you talk like that? Thousands of dollars just to try to get the effects that you can get with, with something like a machine. Right, right. Yeah.

I don't know if this a Japanese study that they did on people that live in over 100 years old there. And they, they measured their breath and they found a higher concentration of hydrogen in these Ontarians than in their breath, than the general public.

Interesting. Oh, so hydrogen is linked to longevity and healing in many cases. Also, the miracle healing waters around the world. They measure the hydrogen concentration in all these miracle healing waters.

If you bathe in drink, line up to fill their bottles to take home a drink. There's a higher concentration of hydrogen in that water than normal. So there's still healing effects from the water, and it's associated with healing.

But to really jumpstart the body's healing process, the inhalation, you know, there's no comparison. And by the way, the healing water that you mentioned, this is this is actually a perfect example of kind of what I was talking about with regard to biochemistry.

Oftentimes, I think that the first approach is like, okay, well, what's in the water? Well, let's look at the sulfur content. Let's look at the mineral content.

So we're like we're kind of locked in mentally to this idea of macromolecules in these things. And it's like, okay well we're missing the boat here perhaps.

Right. Like sure. And there's sulfur is important and minerals are important. Magnesium and all these trace minerals great. And like what's underneath that. Right.

And so that's a perfect example. I didn't I didn't know that about the Japanese study in the centenarians. But this is where a lot of the research actually, I found has really been proliferated.

Is is in Japan, in the eastern countries. Right. It's like there's thousands of studies on hydrogen. So this is the this might be how you can measure concept for people, but this is not new for the scientific community around the world.

This has been proven and studied many, many times. Yeah. The the Asian countries are much more ahead of the Western countries with regards to hydrogen and healing.

Yeah. Another different association is do they say fiber reduces the risk of cancer. Colon cancer. Right. You know doctors or people repeat that. Well they don't say why what's the correlation.

You know fiber does fiber kill cancer. No. It's like it's the microbiome that digests the fiber producing hydrogen which heals the cancer. So they then experiments where they, you know, remove the microbes that eat the fiber that produce hydrogen.

And there's no more benefits from the fiber. And so in that case, the the hydrogen is correlated with the health and that the fiber. So interesting correlations here with hydrogen healing.

And this marries up with a lot of the the amazing gut researchers that I know they're actually looking at. Okay. Well it's not necessarily what you eat, but what does your microbiota metabolize.

So when we eat foods and take these certain substances in, you know, the skins from blueberries or red wine they go than other people love the red wine and the benefits there.

But as like an award, what are the microbes doing with those phytochemicals, with those compounds that you're eating? And that seems to be where a lot of not not not all right.

Because there is a direct interaction, let's say, with the with the RNA and DNA of plants. But in the substance, what does your microbiota actually digest.

Right. So this becomes a really important factor. So I'm curious what did you notice or what have you noticed with the people that you've interacted with, the patients in the clients.

And then these type of things that have used hydrogen therapy at the proper dose. What kind of benefits of this. Yeah.

How Hydrogen Supports Energy and Mitochondria

Well, I kind of narrowed it down to five main points that, you know, we've noticed both in myself and clients and what people report back. And, you know, the science, you know, backs up this as well.

And that's to name a real quick. And we can go on details on each of these. But more energy right. People notice that you know that comes with that comes better healing inflammation inflammation reduction.

Any conditions that you know are related to inflammation improves circulation. You know, we see that under microscope as well. Improved brain function and faster healing in general.

So so those those five things we're talking about, and with regard to more energy, we found that the hydrogen makes the mitochondria more efficient in producing ATP molecule.

And also it gobbles up these, you know, you know, oxidative stress type of molecules, reactive oxygen species. And so not only does it seem to make the process of producing this ATP molecule more efficient, it's reduces the inflammation.

The results of, you know, bad metabolism on the mitochondria, you know, cellular level. And so million of the clients we experience, you know, that are, you know, energy levels, super strength performance endurance and faster recovery.

Those are some of the first things people notice, you know, if they're in tune with their bodies, which is what you see in athlete community too, right?

This is like a big thing for those in the know, you could say, because there's still people that aren't aware of this, but but athletes are always looking for that edge in terms of formance.

And I think more importantly, probably in the last 10 or 20 years that I've noticed is like there's a huge focus on recovery. So how do I recover so that I can get back into whatever performance, you know, mechanism I'm looking for.

Exactly. And there was a also a study in Japan was using this for some of their elite athletes, you know, track athletes. And they found that their elite athletes were getting a 3 to 4% improvement when they were using the molecular hydrogen, which is massive in the athlete world, like in that world, if you could get one or 2 or 4, like that's massive, right?

So so some of that's really into sports and connected with some of these sports teams. And then that likes to beat on teams. I was thinking then get that team one hydrated and you can bet on them.

They'll outperform all these other teams. So there's a lot. And you know what's interesting. You know about that sort of mitochondrial side. I remember looking at a number of papers on this that.

So when it is for those who aren't so familiar with mitochondria, right, the natural processes that they're going to produce ATP. Right. And just on the energy side of things and, and in all cases we're going to produce reactive oxygen species, these sort of damaging byproducts of cellular metabolism. And this is normal. Right.

And this is in fact some of these are actually signaling molecules to the DNA. So they're not they're not entirely bad. This is just a natural byproduct. Right.

You could say exhaust from from from a car type of thing. But but what molecular hydrogen does is that it selectively targets the most damaging forms of reactive oxygen species.

Which is why because there's like 3 or 4 different types of reactive oxygen species. Some are more damaging, others are less. And this seems to go after and neutralize the most damaging forms.

Which is why I would totally blew me away when I when I came across that. Right. So do we. We do need some oxidative stress because that stimulates, like I said, actually it's a tree molecule for other bodily processes, you know.

But when you exercise you stimulate that and that it, you know, tells your body to okay, build muscle, you know, be more resilient and so on. But yeah, some of these molecules are super, you know, reactive like like a super oxidase anion.

You know, it's like A02 negative molecule, the hydrogen peroxide in the hydroxyl radical, the O negative molecule, if they're not kept in, checked, you know, to a certain level that cascades into inflammation.

And a lot of these age related diseases. And as we age, we don't have as many antioxidants or our body's not as efficient. It's producing a natural glucose ion as an intact and the to help keep these in check.

And that's what the the hydrogen helps to do. It increases the body's natural production of glutathione as well as reduce or neutralize an overabundance of these, you know, free radicals.

Yeah. I mean, it's it really is pretty amazing. So let's let's talk about gut health. So how are people using this? Is it only through water. Is it through inhalation as well.

How does it impact the gut. What's the most effective sort of way to get this to? If somebody has got, you know, inflammatory gut conditions and they've got digestive issues, there's there's all kinds of stuff going on at the gut level.

What's the most effective way to take this? And what are people noticing? Well, we find that inhalation is you get an 80 to 90% of the benefits through the inhalation of hydrogen.

And so a lot of that helps to heal your gut and bring back a natural, more diverse microbiome. But also to we notice that just drinking the water it helps better with, you know, digestion, better elimination and just the microbiome in general.

So on. In other words, the gut health. Something I want to mention here, there's a study in bile medicines. May 2025. So not too long ago. And this study tested if the inhalation of hydrogen gas could help adults.

Ulcers, colitis, you know, a disease causing gut inflammation and pain. In a small trial with ten patients in half inhaled hydrogen for four days, four hours daily over a eight weeks, while others got a placebo, they were inhaling just the air, you know, because you really can't tell the difference through the air and hydrogen.

So they found that the key benefits include improved gut bacteria, diversity boosting helpful microbes and reducing harmful ones, so which may repair the heart for months.

And so this may repair the intestinal lining and calm immune system response. You know, because it also moderates immune or immune system overactivity as well.

And so also with these people on this trial there, the endoscopic exam showed less gut swelling. A more hydrogen use is achieved for symptom relief from the, you know, condition.

Yeah I love that. And so to me what that's really saying you know if we run a gut test right. We're often looking at diversity. In other words, how many different species of microbes are we seeing on this gut test.

Right. So that's a key factor. The lower the diversity we tend to see more disease processes, chronic inflammation, etc. and the greater diversity we see, we see better health also.

Right, right through a keystone stream, we have sort of what we can identify as biotics where these beneficial strains. And then we have harmful ones that that when they're out of balance, when they're in over abundance, we start to see again more inflammatory conditions.

So we want to see that that balance improve. And so the hydrogen is directly affecting that. So it's really interesting to me because once we start to see diversity increase and we see the keystone species increase, now it has this knock on effect of everything else.

As you mentioned those microbes are communicating with the immune system.

Gut Health, Inflammation, and Microbiome

So without in other words, if we just wipe out the microbiome and just completely knock it down, we're going to see poor immune function. We're going to see leaky gut.

We're going to see all kinds of, of, of endotoxins being produced, which affects the liver, which affects the kidneys. I mean, everything downstream starts to get affected.

Of course, the brain, right. We have the vagus nerve that connects the brain and the gut. So it's like once you start to disrupt that microbiota population, which is kind of like a rainforest, right?

There's just so much going on there. We'd like eyes out. Yeah, everything downstream goes haywire. And this is what we see in in fecal microbiota transplants, right where we have we take the healthy stool, a stool from a healthy individual, and we sort of implant that you could say rectally.

And this is a medical process or procedure, right. We can see weight loss. We see inflammatory conditions go down. So in other words, simply by replacing a disrupted microbiota with healthy microbiota, all this stuff starts to happen.

Right. And so it's like it's like that really is such a key driver is just getting that microbiota population back in balance with greater diversity. Right. So this becomes a really key factor.

Yeah. So it seems like the hydrogen is helping retain or improve that balance of the micro you know bacteria microbiome that's going on in there now which is great.

So you may have to maybe you can avoid those fecal transplants right. By just breathing molecular hydrogen at 100%. And again people are trying to do it with probiotics and prebiotics.

And these are great too. They can be. But it's also a I would say a very crude attempt at trying to manipulate the population. Right. It's like imagine, imagine a rainforest and you're trying to inject certain species of other animals into this rainforest.

It's like you're probably not going to have an effect there, right? There's a bigger global thing happening, which is again, so it's like hydrogen becomes a bigger lever that we can pull with respect to changing that, that ecosystem in a positive direction.

I'm curious, is there any negative effects that you've seen of hydrogen? Because I haven't found any yet. I think there's always possibilities, but I just haven't found anything to suggest that you can kind of overdo it.

Or there's problems when you when you take hydrogen. But yeah. Well, there's, there's two things definitely. So maybe if I learn something about they're not necessarily negative but the things to be aware of and watch for. Right.

And so one thing is that anyone that's on blood thinners. Right. Any popular blood thinners actually my, my father in law came over and was like, you know what to try.

The hydrogen has how the health is in the best. Right in so so reading it and he was reporting back to his doctor, you know, taking a test every day to, I guess, measure the viscosity of the blood.

And that's the way I, as an engineer, I would say, right, I don't know. They're the medical term. Right. And so, that so he sends in the tests calls that could mean something's going on.

Your blood is like, you know, wait way too thin, you know, what are you doing? He's like, well, I started reading this molecule hydrogen. You know, and so these these drugs which are unnatural to the body when your blood heals itself with hydrogen and we can go back into the electrons, which, you know, most of the cells in the body are all the cells in the body have a natural electrical charge, a negative charge around them.

That's how they that's in the healthy state. And when your blood becomes toxic in you, you've got, you know, micro clotting going on. What happens is like some of the cells become positive.

And so you got this negative in the negative and positive they attract, you know, just like north and South pole remaining sticky. And when you got that happening your D-dimer test scores go up.

You've got these little micro claps going on with these with the cell cells you stack and like pancakes in Brazil. What the in the process of creating the hydrogen, there are a lot of negative ions.

Your negatively charged you know hydrogen and oxygen. You know atoms or molecules that, you know, come out of the machine as well. And that brings back the negative natural negative charge to yourself.

So it's kind of like walking on the beach or being in nature and just experiencing those natural negative ions. You know, there's and also people call, you know, earthing or laying on a earthing mat or walking barefoot.

You a body absorbs those natural negative ions and your body's electrical and those electrons are important. And so we find the hydrogen does that. It brings that negative charge back to your cells.

And so which reduces any micro clotting and so on which brings back a natural flow to your blood. And so anyone that some blood thinners go back to that initial, you know is anything to be aware of.

Yeah. Blood thinners that needs to be monitored by your doctor. If you're introducing hydrogen into your protocol and if you're on blood thinners at the same time, you know, a good doctor would monitor that and gradually reduce the the medications, right.

And maintain the hydrogen. Some doctors that are not familiar with it, they scare the patients into say, oh, we mess up the hydrogen stuff. They're not familiar with it.

But, you know, progressive doctors say, hey, it's something natural is working. Let's continue that and reduce the blood thinners, you know, so that so that's one thing to keep in mind.

Yeah I'll see. Ideal state anyway. Hopefully. Yeah. And so the other thing to be aware of is it's the hydrogen seems to help any organism that contains mitochondria.

You know we talked about so the mitochondria is all about you know separating the proton and electron which is basically hydrogen in this Krebs cycle. Right.

And recombining them at the end. You know what the the mitochondrial membrane that has a gradient between positive negative that the last part of the Krebs cycle, the proton actually passes through the membrane in a little nano motor which turns it, which actually produces almost physically.

You can think of the device that ATP molecule. And so in that process. So the point is that a lot of almost all organisms and cells have mitochondria.

And so bacteria have mitochondria as well. So a really bad infection like sepsis or something that's really got your body down I mean colds and fluids, they're they're not so much of a problem that hydrogen helps in those cases because it boosts boosting natural immune system and that out, performs any benefit that hydrogen can provide to these, you know, bacterias.

But in a serious infection that's really got you down or that's not under control, I say it's best to get that in check first. And in some cases you may have to take any bites or, you know, real medicines.

And when that's in check, you can, restart the hydrogen therapy's got. Okay. So the other side of this of this summit is, is the brain component. Right.

And so I for me, I know this is a big one. I know I've heard a lot of people, tout the benefits to brain health, mood, energy, clarity, this type of thing.

So, so what have you noticed and what is the sort of research that you've seen, say and read to brain Health, right. Me clients, everyone. It's like across the board what we see.

You know, as far as we notice in our brain and mental state is just more mental sharpness, improved memory, a clearer mind is just more productive in general, less brain fog, because that that was a problem for me.

But, you know, brain fog and, you know, fatigue in those were alleviated once I started the hydrogen. Also, better sleep in most cases. And something people notice that I you know, I know it's this this is an effect because you report back to me.

And that's also more vivid, colorful dreams. More lucid dreams. I don't know if you've noticed that yourself, but it seems like the Hydra wakes up your mind in a way that it makes it your brain function in a more natural way.

We should be dreaming every night and having lots more REM sleep and any forms of like meditation where you want to focus or improved dramatically. And just, I mean, going to sleep sometimes at night and reading the hydro

I'm sleeping is like going from the world.

It's like a vivid, colorful world. And anyone that meditates also receives benefits as well. So it really activates your mind in a way that is, you know, different than other supplements.

But not just that. But like a lot of these age related, you know, brain conditions like Alzheimer's, Parkinson's, dementia, my clients continuously report back that their symptoms lessened with all these type of things.

And some just if they don't have these conditions, if I get the report back saying, hey, I'm remembering things that I'm that's making me surprise myself, you know?

So it's it's good to hear that kind of feedback.

Brain Health, Mood, and Anxiety

And I feel like if any, you can I say that it literally makes you smarter. I mean, I'm sure your IQ goes up as well. And with that, you become more productive.

You're a better thinker, you're a better problem solver, and so on. And so I mean, it's just like unbelievable that the effects and that happens gradually over time, you know, it improves.

But it's enough that you definitely notice. Yeah. I mean this makes sense, right. Because again the molecular hydrogen's effect particularly on the mitochondrial electron transport chain, the ability for the cell and the mitochondria to make energy to be healthy.

And of course, we've got the brain, the eyes, the heart, the liver, the kidneys. To some degree, these are all mitochondrial dense organs and tissues, right.

So wherever we can have a lot of mitochondria, you know, in something like the brain, there's not a lot of, of, of energy reservoir. So in other words, this very high demand of energy, the brain requires tons of energy.

Right? So those, those, those neurons, the all the cells in the brain, they, they have so many mitochondria, the mitochondrial dense right cells. And so we need those mitochondria to perform well.

And when they don't this is when all the brain function starts to deteriorate. Yeah. So another interesting point to make. There's like as I realized that it was the mitochondria.

That's the key in how hydrogen was influenced the production of energy. They were which cells have more mitochondria because maybe those cells are held more.

And it turns out that the neurons, you know, you know, when your neurological system and your brain have a higher density concentration of mitochondria than any other cells in your, in your body other than one particular.

So, you know, that is the, the metals that I but well, so the the male sperm cell okay. If that makes sense. You know, I guess they got a lot of energy to expend.

Right. So between excess they say I as well, but between the nerve cells, the sperm cell and the I cells, those are the three areas where the mitochondria concentrate the most, you know.

So go ahead that there's a lot of feedback supporting the eye health with regards to hydrogen. And so that makes sense. That eye health would improve macular degeneration also improve blood flow through the to the retina as well.

And so it improves eye conditions. Yeah. And one thing that's important about mitochondria too is that we all get them from our mothers. Right. So male or female, no matter what you identify as you're getting them from mom.

Right. And so protecting mitochondria is really, really important when it comes to just the, the the next generations. And so this becomes a really critical factor in not only disease prevention and recovery of disease, but in in growing healthy new children.

Right. So any any young parents out there or anybody is looking to have kids. To me, this is like one of those things that you can you can start to influence the health of, of your future children.

I mean, this is really, really profound. Mitochondria are so, so unbelievably important to how our body functions in every way. And of course, every cell has mitochondria except for red blood cells.

Right. So this is it's not something we can overlook. And to me, this is why I love having you on this, because I, I'm always looking for what's the biggest lever we can pull.

And and this is why some of these things, they kind of sound like a panacea. Oh, well, it sounds like it fixes everything. What it kind of does when you start. Yeah, yeah.

I don't think there's at the mitochondrial level, you can improve skin, eye health. Is that hair regrowth hormone production. Because mitochondria are, are central in in generating hormones in and of this are actually what I say the the mitochondria is lower than a cellular level.

You can't really go at a lower level than that. It's like a foundation. And if that foundation is in really good state, inefficient and working properly and strong, then everything that stacks on top of that your cells, your organs, your skin, your mind, your nervous system, everything.

It starts to heal itself and fall into place, rather than that foundation lacking and crumbling and producing, you know, toxins or free radicals that just bring yourself down and cascade into into diseases.

Absolutely. So, you know, I'm curious, you wandered into this world of molecular hydrogen. You did the research. You said, okay, this is there's something here this is worth pursuing.

There's also a couple other products on the market, right, that produce hydrogen, hydrogen machines and whatnot. So I'm curious, as you were developing your the H2 Genesis, what was something that you felt like that you could produce that was different?

Why did you decide to go in the production of making your own machine? And what are some things to look out for when someone is looking for a hydrogen machine?

I mean, I don't like to put anyone other anyone doubt out there making hydrogen machines. The more hydrogen out there, the veterans sure. For sure. But, what I say is hydrogen is hydrogen.

You know, once you've but I mean, at the time when I first got into it, 5 or 6 years ago, the only machines that you can inhale from were, you know, five, six, 7000, $10,000 in.

They were really, you know, kind of off limits. And as an engineer, I was already running my car partially on hydrogen. So I knew how the electrolysis works.

So I'll just scale down the machine to a point where I can safely use it for breathing. So I did this experiment for myself and started getting results.

And so we started with initial machine that I built with off the shelf parts. And that was, you know, the initial machine was considered a Brown's gas machine.

You know, that's when Brown's gas, the hydrogen needs to be produced in a alkaline, you know, solution, lye solution or sodium hydroxide. And since then, the technology has evolved to have special membranes, a proton exchange membrane between the plates in the machines.

So most machines have those nowadays. I mean, what makes us different, I think, is because, between my electrical, you know, engineering background, I understand what's going on inside the machine in this long as I study natural health, in understand in the research.

So scientists, I wanted to understand the working mechanism, what's going on in the body, and then how that cascades into healing health and, you know, elimination of a lot of diseases.

And so what makes us different is like, I can talk the whole spectrum in for hours and hours on testimonials and protocols and how to implement those as well.

So how do you use yours now? Like what is yours? You know, I, I assume you're there's nothing that you're treating per se at the moment. That's pretty significant.

So there's always things that crop out like a, like all of us as we as we get older. But, but how do you like to use this. What's the typical sort of protocol that that one would, might go through as a sort of preventative and just kind of minor update type of, of approach, right, right.

Well, I mean, I like to experiment myself, you know, friends, clients and services. Right. And so initially I was almost breathing at eight hours a day as I slept overnight, knowing the volume of the hydrogen, to a point where I can comfortably breathe all night and to see how that would affect me.

And so, you know, you can do it for hours and hours and you'll still live. I'm an example of that. Right. But but nowadays, what I'm recommending, especially with our machines now, I think a more intense those kind of like exercise you can thing, you can't exercise 24 hours a day, you know, in some not even exercising once a day is too much or sometimes once, twice or three times a week is enough for exercise.

But with regards to the hydrogen, you know, we've got enough feedback from hundreds of thousands of clients now that it seems like minimum one hour a day, you know, in the morning is good because it kind of energizes you and not not similar.

But unlike coffee, you know, coffee is like really steaming. It's going to like, why are you the way I say coffee steals energy from tomorrow to get through to.

Yeah, like that's the reality. And most people don't like to hear that, but that's the truth. Yeah. And then hydrogen, it seems just to jumpstart your whole body, just wakes it up in a natural way.

Because hydrogen, you can think of it as a supplement. It's natural to your body. And so what I say is like minimum one hour a day, you know, work it into your schedule whenever you're sitting still, when you're falling.

I mean, I do now like two hours a night as I'm falling asleep, turn around with the timer shut off after two, two hours. So I'm actually I may do it in the morning or during the day if I'm sitting still at the computer, you know, watching a movie or working on the on the phone or something like that.

And so anywhere between 1 or 3 hours a day seems to be ideal, especially with people that with health conditions, we know some you know, clients with, they say Parkinson's, their symptoms lessen going from one hour a day to three hours a day.

And so that's something to keep in mind. So in some cases more is better depending on the condition and what you're trying to heal or get over with. And so that's something to keep in mind.

I think what's nice about that is that you don't have to be super precise right there. Certain things like that. I love red light therapy, for example.

And there's a dose response curve. In other words, too little is not going to really generate the benefit you're looking for. Too much can actually have a negative effect.

So you kind of want to be in this very precise or relatively precise window, right? Something like hydrogen, you can actually be pretty loose with it as long as you're getting enough I think, like it's pretty hard to overdo it.

Yeah, exactly. What avoids you overdoing it is just your schedule. I gotta get up, eat and clean the house or do something right. So that's going to be your limiting factor in what I'm making sure you get enough.

It's you need to be that minimum dose. Like I said we found is really the inhalation, you know, one hour inhalation a day. Is that that minimum dose to really jumpstart things.

These water bottles that are produced, hydrogen, you know, bubble through the water and dissolved in there in the tablets, that's not going to get you to to the full potential of what I showed you for your body.

Right? Yeah. And that's, that's the case with a lot of things, even sort of supplement wise, like, you know, different a couple more studies I want to mention with regards to the brain and mood and so on. Right.

So because, you know, that's one of the focus of, you know, this summer's here. And so let me read off a couple more studies real quick that have some really interesting results.

One is regarding mood and anxiety in my journal called Medical Gas Research, January 2017. They found that the hydrogen which rich water they use hydrogen rich water for improvements of mood, anxiety and or other autonomic nervous, you know, function, you know, in their daily life.

In a placebo controlled trial in 26 healthy adults, you know, showed four weeks. Let me I'm reading this right. Yeah.

Machine Design, Usage, and Safety

So the 26 healthy adults showed four weeks of hydrogen rich water intake, improved mood, reduced anxiety and fatigue scores, and enhanced autonomic function, suggesting benefits for daily stress related brain fog.

In mythology. And so I'm wondering when and if that's going to influence the autonomic nervous system then. Then we're talking about the parasympathetic and sympathetic balance.

So if we're in that ruling, that regulation meaning that we're having a better parasympathetic response that's going to improve digestion, that's going to improve detoxification, that's going to improve, obviously, just the sort of stress hormone or milieu that that happens.

So everything that that we're talking about when it comes to the quote unquote rest and digest is going to improve. Right? But again, the detoxification important I think is really important because I walk through people through that a lot of detoxification protocols.

And if their nervous system is unable to actually get into that parasympathetic tone very well, then they're going to have a really hard time detoxing.

And so they can do all the detox protocols. But the nervous system is literally kind of holding them hostage and preventing proper detoxification. And elimination.

Right. In regards to, say, PTSD, anxiety, when one particular client would have like anxiety attacks and that would last for, you know, half hour, 45 minutes.

And when she began using begin using the hydrogen those the length of those anxiety attacks reduced from 5 to 10 minutes. And she actually, you know, showed her daughter how to like get her into the bed, turn the hydrogen machine and get her plugged in.

And so that because, you know, when she's in that stage, she can't think totally and share her, her life improves so much when she's got that under control.

And another study and pub pug med pub med. I can't talk now to the effects of hydrogen on the effects of hydrogen water in psychological treatment. In a sample of women with panic disorder now ran amok a randomized controlled clinical trial.

So in this particular study, the use of hydrogen therapy showed significant improvements in anxiety severity. Reduced reduced pro-inflammatory cytokines levels, and better general health status.

I mean, it's pretty pretty amazing, right? Again, when it seems like it's a sort of panacea, you know, it's because of all these. And by the way, I think there's like last time I checked, there was over a thousand studies on hydrogen water.

So I don't know what it's up to now. I know, in fact, I think there is a site that actually is cataloging all these things because it's, it's they're becoming.

So there's so many of them these days. Yeah. Now there's some more studies coming out on humans. A lot of the earlier studies, you know, before, you know, 2017 well done.

An animal and hydrogen water. Now we're going to see even more. And they're starting to come out now in the last few years, more studies with humans and with the inhalation and the benefits are off the charts compared to the benefits that people were seeing with the water and with the animal, says, yeah, like I said, I can't I can't be any more of an advocate for hydrogen therapy.

I mean, it is truly a game changer, especially for those suffering from chronic conditions that that seem to have, a lot of them get stuck. And, and I'm very sympathetic to this.

I work with a lot of people like this. And, and so when you can introduce something like this that has this big of a global effect on the body, it's it's kind of a no brainer to work into whatever protocol that you might be doing, because there undoubtedly there's other things that one might need to do, but this is one of those things that you can layer on top of pretty much any protocol, right?

If you if you have cancer, like there's no downside to to hydrogen therapy. I mean, it is exactly. I work with some oncologists that are getting, you know, tremendous results.

And they've seen, you know, on ultrasounds, watch, you know, tumors, you know, reduced in size. And there's a lot you can find studies online just open in like a hydrogen cancer in one particular study two of them.

And you just found some cancer. You know, they a study investigated a combination of hydrogen gas inhalation with lung cancer patients in this particular trial showed a remarkable increase in overall survival, with average survival extending from nine months to 28 months when combined with hydrogen gas.

They said the mechanism involved was activating the coenzyme Q10 to restore T cells in particularly enhancing the body's immune response against cancer.

And so, like you said, like across the board, if we're work at a mitochondrial foundational level with energy, improving the immune system, what's a good, healthy immune system could fight off cancer?

I mean, young kids have cancer all the time, but a healthy immune system, you know, just squashes that. Yes. It's already, boosted immune system in, in reducing the spread of cancer because once your body is primed with molecule hydrogen, it's almost impossible for cancer to spread.

Well, and what's interesting too about these studies, you mentioned they were done, you know, not on humans, but as we even get into the human level of of research and study, you know, a lot of these studies, the one you just brought up, I think went for four weeks or something, and they noticed tremendous benefits.

So where my mind goes as well, nobody's going to do a 30 year study, probably because that's way too expensive

and takes too long. But what if one were to to use this for six months, a year, five years, ten years?

What are the benefits that we're going to see after that? After prolonged use? Regular use? I mean, I can only imagine it. Exactly. And what what the great thing is, once you've got a machine yourself that you can use for inhalation, all your family benefits, you know, your spouse, your kids, your phone, your and so uncles. Everyone can benefit from it.

So it's like a multi-use kind of thing. And it should last if you're taking care of it, should last a lifetime. So in my opinion, it's the best money you can spend on health compared to any other health protocols out there.

And be a natural, you've got nothing to lose. That I agree. And this is this is one of the biggest benefits of something like this is it's not only investment in you, but it's an investment.

Your entire family, you know, it's saunas are the same thing, right. Like this is actually been in this world for a while. This word biohacking and health, optimization world.

And it's like, that's kind of what I'm looking for. How can I, you know, whole house water filtration. Another example like these things that I can invest in not only for me but for the 3 or 4 people that are in my household and perhaps the people that are coming to visit and that might want to just use this as well.

Because that's, that's something I like to do, is share these tools with those that I know. Right. So it's it's a huge investment that can pay off unbelievably well for, for one person, let alone a family.

Right. So it's it's one of those things that I think is unlike many other therapies that that you have to kind of individualize. Right. And you can only take for yourself.

Right. Right. Yeah. I mean, like the, the ozone hyperbaric oxygen, red light therapy, you know, PMF, you know, type stuff. They'll work to some degree. But I mean, I've tried them all.

So I'm like a hacker Biohacker I, I want to try the most. That works, but I the only thing I do continuously and have not stopped is the hydrogen. I find there's more benefits the the time spent you know, breathing the hydrogen on that is much more is much more productively spent and in practical.

Yeah. And that's really the only thing I do nowadays. I may do my red light every now and then, but the hydrogen I do daily, you know, there's just so much benefit to that.

Awesome. Well, this has been fantastic, Ben. Tell people, if they're interested in getting an H2 Genesis where they can go. And I believe you said you might have a discount for them as well. Right.

So tell me about yeah, yeah. As part of the summer here at summit here, you know, we we do offer a discount to the attendees here. Our website H2 biohacker.com.

And you can find lots more information. I when I first created a page, I pulled all the best information out there and hydrate and kind of consolidated and assimilated into this website.

So if you click on learn More on our website, you'll help to see some of my story as an engineer and, you know, healing story as well. So you can find a lot more information there.

And we sell two machines there. We don't sell water bottles, tablets or anything else like that just because I find them unaffected. Then I worth the time.

And I'm very I'm not like a sales person. I'm not like an engineer. I want to know what's what's practical, what's going to work. So we only focus on two machines.

One is a browser gas technology, one is the proton exchange membrane technology, and they both produce one

liter of gas. And I'm not going to bother with any other products or some red lights or anything other crazy stuff.

I just I know what works and that's going to focus on. And so you can find more information there on our website H2biohacker.com, the discount code there.

To get a good bit of money off our one of our products there is doctor talks. So just D R T A L K S drtalks.com. But in general to wrap up some of the stuff with the hydrogen, you know, how you really jump starts, you know, healing the body in all major systems in a very holistic way.

It's safe, it's natural, and it can be used in conjunction with other therapies. So there's almost no negative or downsides like prevention. You know, you know, is your, you know, you know, thinking of those other two examples I mentioned that you should be careful of. Right.

And so only positive results have been seen by our clients. And these, you know, results are backed by real research and scientists. You know, we're not just inventing this stuff.

And so also on our website, you can sign up for a free 30 minute consultation where you can talk directly with me in most cases, where I can go into details on how and share my experiences on what I've seen, the healing that you can expect based on, say, your conditions and the feedback that we've got from other clients. So we've got a very personalized service.

So if you got particular questions about your condition, you know, technical or anything like that, but you know, we we spend time to actually talk with our clients, you know, and get to know them.

Amazing. So H2biohacker.com go check that out. And and the discount code is DrTalks. So again thanks so much for joining us that I appreciate it.