[00:00:00] **Dr Mike T Nelson:** Welcome back to the Flex Diet Podcast. I'm your host, Dr. Mike T. Nelson. On this podcast, we talk about all things to increase muscle via hypertrophy, strength, performance, improved body composition, all without destroying your health in a flexible framework. Today on the podcast, we have Mike Chesney from Tecton.

[00:00:23] Tecton makes exogenous ketone products and you May have heard of them before you may not have It's very interesting. So I do have a Conflict of interest full disclosure. I am a scientific advisor to tecton and I am an ambassador for them So you can either think of that as i'm very biased towards them, which is probably true or and I also know lots of cool stuff that's going on in You the background that I can't legally talk about in public yet.

[00:00:59] But it's been super interesting to work with them over probably eight months or so now. So Mike there is the chairman of the board and chief of innovation, and we'll be talking all about how to use their product and ketones in general for different purposes. Everything from potentially cognition under fatigue.

[00:01:22] Alternatives to caffeine, and even hypothesize how it may help with certain different pathologies and diseases. What's cool about this one is it is an exogenous ketone, meaning you can take in the ketone molecule itself. You don't necessarily have to do a ketogenic diet, and it'll be used by your body.

[00:01:46] There's two main types of ketones. One. the salt version, where they take the ketone molecule, commonly BHB, beta hydroxybutyrate, and they bind it to some type of sodium, magnesium, etc. The downside with those is that you can't really seem to get higher levels of ketones in the body. So the other way is by forming an ester bond, or what are called ketone esters.

[00:02:11] And we'll talk about all the different types that there are for these different ketone esters how the Tecton one is a little bit different. But in general, by doing that type of process, it allows it to get pulled up through digestion and can be used by your body and different cells. As Mike talks about here, too, you can't just take in the ketone molecule, the BHB molecule, in and of itself.

[00:02:36] It just doesn't do anything. It just gets washed out. So you will see other products on the market now who are trying to use maybe a combination of an ester, combination of a salt, or just only straight up BHB not bonded to anything else. And all the data I've ever seen on that shows that the, without bonding it to anything else, just doesn't go anywhere.

[00:02:59] However, it's dirt cheap to make. So we'll talk about that. And it's super interesting. I'll link to a program I did for the Carrick Institute that looks at the impact potentially of ketones and ketogenic diet. Also with TBI, Traumatic Brain Injury, and Concussion. So I think you'll enjoy this episode. Also wanted to remark that it's brought to you by LMNT.

[00:03:25] So I am out here in Vegas right now as of this recording in the morning. We're getting ready to go to the Real Coaches Summit. So shout out to Aram for setting that up. Super excited for day one here. and especially flying on planes it's crazy to me how they appear to be very dehydrating very dry, and you're not really moving around.

[00:03:48] So whenever I have a plane flight, I always try to have at least one packet of LMNT with a liter of fluid per flight. It doesn't ameliorate everything, but definitely really seems to help so I don't feel Nearly as bad, especially the next day. So LMNT is a high sodium electrolyte mix and actually tastes really good.

[00:04:09] Which is surprising. They made something that's really that salty on purpose, but tastes really good. So you can check that out. You can get a free sampler packet via my link. And if you don't like it for any reason, you can just contact them and don't even have to send the product back. They will give you all of your money back.

[00:04:27] So go to drinklmnt. com forward slash Mike Nelson. We'll have that link below. Last super quick note, cause I don't like interrupting the podcast once it starts. The Physiologic Flexibility Certification opens up on Monday, March 18th. So if you're listening to this, when this podcast comes out, that is next Monday.

[00:04:50] It'll be open for one week until Monday, March 25th, 2024. So if you want to know what to do after, you're pretty good at the basics of exercise and recovery via nutrition and sleep. This in my opinion is the true level two to the FlexDiet certification. The whole goal of the Physiologic Flexibility Certification is to make you more resilient, increase your recovery ability and just generally make you much harder to kill.

[00:05:20] This is done via the four pillars. One is temperature differences. This can be everything from cold water immersion to sauna to even exercise in the heat. Number two is pH changes. This is primarily focused on aerobic training and how your body is generating changes in pH via breath work and aerobic work.

[00:05:40] Everything from zone two all the way up to true high intensity cardio. Pillar number three is, as we talked about on this podcast, ketones and lactate. You can think of ketones as a byproduct of fat mobilization and use, fatty acid oxidation, and then lactate as a byproduct or cousin of high carbohydrate use.

[00:06:01] So we talk about an expanded fuel section of why both of these can be important, just depends on what you're doing. And last one is breathing. Everything on how your body regulates oxygen and CO2. So check that out and go to physiologicflexibility. com. Thank you so much for listening. Huge thanks to Mike for being on the podcast here and enjoy this chat with Mike Chesney from Tecton.

[00:06:27]

[00:06:27] **Dr Mike T Nelson:** And welcome back to the podcast.

[00:06:29] Thank you so much for being on here, Mike. I really appreciate it.

[00:06:32] **Mike Chesne:** Thanks, Dr. Nelson. I appreciate what you got going on here and appreciate you working with us, Mike.

[00:06:37] **Dr Mike T Nelson:** Yeah. So, for people who aren't familiar, give us just the short one sentence, of what exactly you do now, because you've got a pretty wide Lots of cool stuff now that we'll get into.

[00:06:48] **Mike Chesne:** Yeah. Mike Chesney, I'm the chairman of the board and chief of innovation for Tecton, which is a biotech company that bases our products and our innovation on an exogenous ketone. Why that's a, that's always an interesting question. I worked with. The, kind of the founders of exogenous ketones at Oxford University Dr.

[00:07:12] Kieran Clark back in the day. to 2013 14 and worked with her for several years. Brilliant scientist absolutely incredible lady and just a really great person. But the things that she was working on had limitations like many things in science. And The direction that they wanted to take their exogenous ketones wasn't what I wanted, and that's usually the way that, how innovation and entrepreneurship works.

[00:07:46] My ideas of what ketones are and what ketones need to be is. I think everybody needs them. Human beings, since the beginning of time, ketones are a major source of energy for everybody. So, my idea was let's make it

affordable and let everybody have it. The way it was designed and built in the beginning with, The research and everything that was done.

[00:08:09] It was very expensive and it was designed and built and the dose or portion limitations were for athletes, elite athletes and those types of things. And there was, it's hard to get academics to change. I'm just gonna, it's changed change hard. Yeah. No, it's hundred percent true. , the change paradigm is just like the death paradigms.

[00:08:32] The five stages of death and the five stages of change are almost identical. Yep. So, it that's where we were. And so we ended up parting ways not in a bad way, but, not going down the business route. And so. Went back to the drawing board and said, Hey, there's got to be a better way to build this mousetrap.

[00:08:50] And so sat down literally on a napkin and drew up what I thought would be the better way to do this, where we can make it affordable, make it available to the masses and get it out there. And then went from there and there's a long story that goes behind it. And whenever you're ready, we'll get into that as well.

[00:09:10] But that's the intro of how we got to. That's how we began where we are now, the journey where we are now. That's super

[00:09:17] **Dr Mike T Nelson:** cool. Yeah, and we'll definitely get into the story of that. And previous to this, you were in the military for many years, right? Before you decided, I'm just going to go create a new ketone.

[00:09:28] **Mike Chesne:** Yes, sir. I'm, I was a soldier joined the military right out of high school, 25 years in the army army ranger army green beret finished my service out in a special mission unit at Fort Bragg. Love what I did ended up being medically retired from the service. That's so why I got out. But it truly enjoyed my service would do it all over again.

[00:09:51] I know you probably hear that if you interviewed,

[00:09:53] Very many military people but absolutely enjoyed it. Loved what I did. It was it's what formed me into who I am today. And when I retired from the service, I did some consulting, healthcare consultant in all the great places everybody likes to visit, Afghanistan.

[00:10:11] Iraq, Northern Africa, Algeria, Tunisia, those kinds of places. So all the tourist places, all the tourist spots. And it just got very disheartened with broad waste and abuse in other governments. And that's not me. I'm into moral, legal, and ethical. And if it doesn't fall into those three buckets, I don't have anything to do with it.

[00:10:32] So moved on, started getting into business and that's why. Found some research into ketones. I was working on of all things, I was working on a high energy protein, a supplement. for oncology patients. And doing the research came up on the DARPA was doing a project for the military defense advanced research project agency which does all the department of defense research and development.

[00:11:05] They were doing a nutritional supplement project. It was on the project ended up being an exogenous ketone project. That's how I met with Dr. Clark and started working with the University of Oxford and England and got involved in the ketones to start with. But it all started, believe it or not, with a protein drink that we were trying to get together for oncology patients.

[00:11:27] And then that would morph into for paramilitary people and military, so that they had a, a. a small package ready to drink meal replacement. That's how it started and got into exogenous ketones. And the world just opened up after that. I was like, man, a very compact energy source that we could get to people in a small package, man, what a great concept.

[00:11:51] And so that's where it started.

[00:11:54] **Dr Mike T Nelson:** Got it. And was the angle for ketones there more in terms of an efficient energy? I know Dom D'Agostino has done some work looking at oxygen toxicity work potentially with ketones with, Navy SEALs and other people using non rebreather masks. And there's, the military has been interested in ketones for Quite some time.

[00:12:13] I did a presentation to DARPA many years ago on metabolic flexibility and there was even back then and how those 2010 there was rumblings of ketones and different exogenous Supplements that people could use. Yeah.

[00:12:29] **Mike Chesne:** Military's interest in it at the time was as a, an improvement for cognition and physical performance.

[00:12:38] So there what the military does is they issue something called a mission needs statement that comes from the combat commander on the ground. They say, I need, something. It doesn't matter what it is, but I need something to increase my mission capability. And that need is I need something. And for this particular one, I need something that increases my soldiers, sailors, airmen, Marines ability to increase their endurance, physical performance, and mental performance.

[00:13:07] Cognitive performance by 30 percent is what this mission statement said. For people

[00:13:12] **Dr Mike T Nelson:** listening, 30 percent is a. Massive increase,

[00:13:18] **Mike Chesne:** but that's what they asked for. And yeah, totally. Yeah. At the end of the day, the best that they come up, came up with was about a 3 percent increase, which is phenomenal when you look at Take a an Olympic level athlete or a high end military athlete a special forces ranger special operations soldier who is literally at an almost an Olympic level athlete in performance and increase their performance by 3%.

[00:13:49] Imagine Michael Phelps being able to swim 3 percent faster or longer or increase your marathon time by 3%. Yeah, you just broke a world record. That's the difference that they were able to show, but it didn't meet the mission need. Therefore, the project ended up being defunded after about seven or eight years.

[00:14:11] But that was the way that the program ran. And so that's how the government process worked. But what it does is it gives them a very high bar to shoot at. And who knows, eventually somebody may come up with something that increases performance and cognition by 30 percent based on that one ask that they had.

[00:14:34] So that's the way they started. For me personally, it was completely different. I was one of those soldiers who ended up being unfortunate enough to zig instead of zag and was blown up received a pretty, a moderate traumatic brain injury, had to have quite a bit of treatment.

[00:14:51] And so I was very familiar with brain injuries and our lack, the, anybody's lack of The ability to protect the human brain from injury. And so reading and studying ketones, they're incredible in, Their ability to have neuroprotective, a neuroprotective fact factor. So, that piqued my interest right off the bat.

[00:15:17] That's what got me really involved in it, to read about it and learn about it to start with. And then I learned about all the other things, the cognition and performance.

[00:15:25] And

[00:15:26] **Mike Chesne:** that's what made it more mainstream. For me, personally, it was more about the neuroprotection. And the light bulb in my head went off that, man, if we could get this to the soldiers.

[00:15:34] That's a big benefit. So in the background, that's my long term My long term goal in all of this is so every soldier, sailor, airman, marine will be able to have this if they ever need it in for their training and their missions. So that's, in the very back of my mind, that's always been the long term goal of doing this is to get neuroprotection on for all of our soldiers, sailors, airmen, marines out there so that they don't have to worry about the long term effects of traumatic brain injuries, concussions, trauma.

[00:16:05] So. That's personally how it happened for me. I had to spend four months in a facility in, in, in Houston here, memorial Harmon it's a brain injury center down in Houston. The military was great by allowing me to go down there and do it. It's the same center where Gabby Gifford Senator from Arizona, who was shot went to exact same facility.

[00:16:26] It was different timeframe, but the exact same place where she was treated is the same place where the soldiers that I was treated with was treated. So incredible facility, credible place. But there is one of the places where I learned nutrition has a lot to do with how you heal. Never thought about that before.

[00:16:45] I'm a knuckle dragger from the military. Yeah. I'm an enlisted soldier who, joined right after high school. I didn't go to college. I graduated from college three weeks after I turned 40, what it is, you work through all that when you're in the service, but that's. That's the type of thing that they did to try to take care of us.

[00:17:04] Once we learned that, brain injuries are an inherent factor of being in combat. So, but that's the personal reason why I got involved in it.

[00:17:13] **Dr Mike T Nelson:** Yeah, that's great. And for listeners to that. Even if you're not in a horrible blast injury, there's small micro concussions or whatever word you want to hear associated with it.

[00:17:26] If you're the guy breaching the door, you're firing some of these shoulder fired arms. There's all sorts of things just in, exactly what, people in your role we're doing on a day by day basis too. So there's these, kind of small insults that potentially can add up over time too, just.

[00:17:45] By the fact of you're doing your day to day job.

[00:17:48] **Mike Chesne:** And just as example, some of the people that were in the same facility where we were being treated were, rodeo bull riders who had gotten, one of the top executives at Shell. It got into a car accident and she had a pretty severe brain injury.

[00:18:04] So her life was completely changed and impacted by a head injury. She got in a car accident, a young lady had a stroke 30 years old, she had a stroke. So she, again, a brain injury. And the thing that the ketones do for somebody that makes it neuroprotective is if you have ketones on.

[00:18:27] on board. And that's a colloquial term or whatever. But if ketones in your system, either through natural ketosis, which is, your own body doing it through a low carb diet or through, through you fasting your body your body creates less reactive oxidative species through, the breakdown of ketones than it does through the breakdown of glucose.

[00:18:54] And those less ROSs or reactive oxidative species in the brain, that limits the amount of the secondary effects of those brain injuries. There's nothing that's gonna stop that initial insult, that, that brain injury that you get from, getting a hit. When you're playing football or that blast injury, or, the impact from a car accident, there's, the only thing that's going to mitigate that is equipment, a better helmet seatbelt that keeps you or side impact airbags, those kinds of things, those mitigate that somewhat, but, there's not a lot else we can do, keep working on better equipment, but that initial injury is going to happen.

[00:19:36] The thing that causes the long term effects. The long term outcomes that are poor in brain injury is that secondary neuro metabolic cascade from the cell death in the brain. And that's from that high increase in reactive oxidative species in the brain, which if you have, if your brain is running on more ketones than glucose, that's where that neuro protection comes in.

[00:20:09] So, if you're taking exogenous ketones, that helps. Or if you're in ketosis through a diet that definitely helps. So that's where your neuroprotection

[00:20:17] comes in.

[00:20:19] **Dr Mike T Nelson:** Yeah, that's similar to when I read some of that research back, God, a long time ago now, when I first heard from Dom D'Agostino about exogenous ketones, and I started looking into them.

[00:20:28] I had read some of the earlier stuff on ketogenic diets, but there wasn't as much. And my first thought was similar to you was, people I had known in the military had worked with, and then also people who play concussion sports football, hockey, MMA, where they're going to get hit there.

[00:20:46] That's just part, both of those things. Just it's going to happen. These people have signed up. They, they maybe know the risks, maybe they don't. But to me, it was fascinating that there was something you could do from a biochemical standpoint that may lessen the long term effects from it.

[00:21:03] **Mike Chesne:** Yeah, absolutely. And it's the good thing now is I think there are so much interest coming recently. And, Dom, Domby Agostino is a great advocate and I truly appreciate the work that he does getting out there. The science is starting to really catch up. Last year, there were literally hundreds of papers Published on, the use of ketones, both exogenous and endogenous ketones on different metabolic states, whether it's disease states or these, this trauma neuro protection.

[00:21:40] And it's incredible for me to see it, see the difference in the research that was out there in the data was out there in 2012 and the data that's out there now, what was published in 2022 and what was published in 2012. It's absolutely phenomenal.

[00:21:57] **Dr Mike T Nelson:** Yeah. And I am biased that area. Not only do I help you guys detect on, but even before that I created a program for the Kerrigan Institute that they do a lot of clinical neuroscience.

[00:22:08] A lot of them do a lot of rehab with TBI concussion, a lot of neurologic diseases. I did a whole program for their doctors. The use of ketones for TBI and concussion, same thing because like the data just, and yeah, you could argue we don't have the world's best randomized controlled trial in humans.

[00:22:28] Yeah, I get that. But we've got safety data going back almost a hundred years. So things like the Charlie foundation, people using ketogenic diets, we've got all this other animal data, preclinical data, some early human data. And my argument was, we may not know what the potential upside is.

There's probably a lot more work to be done there, but we're very well defined what the potential negative is, right?

[00:22:52] We know safety factors. We have a pretty good idea of dosing. We know a lot of these other questions already. We don't know what the outcome is, but my argument to a lot of their scholars and doctors was. Worst case scenario, you know what the downside is, so it's unlikely. Unless you're being a complete idiot, you're going to do any harm, right?

[00:23:12] We may not know what all the potential benefit is. There's a lot of data that points to most of it looks positive. And at least in that case, hopefully a lot of physicians then feel more comfortable. At least, hey, maybe I'll try my facility with a few patients. I know it's safe. Like you're, we'll get into the specific molecule you guys use.

[00:23:30] And that opens a door for more people to try it out and to play with it and see what the results are too.

[00:23:37] **Mike Chesne:** And that's the big thing. I understand that people need to see, clinical data for them to be more comfortable with using something, but literally ketones are the human body's evolutionary answer to an energy crisis.

[00:23:54] Human beings have for our entire existence run on ketones. That's what the body uses. When we are starving, that's what the body uses when we are in crisis, you go two days without eating your body starts to start to produce its own fuel by burning fat and those are ketones. And what does that do?

[00:24:19] It heightens your ability to think it heightens your ability to perform so that you can go out and get your next meal. It's the old caveman. The old caveman syndrome, I can think better, I can move better, I can run faster so I can catch that next, the next animal that I need so I can feed myself and my family.

[00:24:39] That's what ketones are. It's that fuel that evolution gave you, God gave you, however you want to look at it, so that you can survive. This isn't rocket science, this is evolution. This is what we've always had. We've just had the, now we have the ability to create it on the outside of the body and give it to you so you can take it and use it externally or exogenously.

[00:25:05] It, It seems pretty simple. In fact, it seems way too simple, but that's the truth of it.

[00:25:11] **Dr Mike T Nelson:** Yeah. And that's similar to my thoughts. When I started looking at it, when I, especially talking to Dom, when he came up with a supplement and obviously Karen Karch's group had done a lot of early work too, that, Oh, so you're telling me I could take a supplement and literally put myself in my air quotes, a state of ketosis, which is measured by ketones showing up in the bloodstream, which is what we'll call.

[00:25:33] And. I could hit pretty darn high levels too. It wasn't like 0. 2, 0. 3 millimolar. Like you can hit pretty high levels. And the fact that happens within 20 to 30 minutes, and you could do this without having to do a ketogenic diet. It just, to me, I could see the possibilities of. Like for soldiers, right?

[00:25:57] There's a lot of downsides to having to do a ketogenic diet. If you have to go do a mission, you have to go do certain things. There's a lot of logistics. There's a lot of chemical outcomes, but the fact that, Hey, I know I'm going to go be a football player. I have a game, or we're going to go to this mission.

[00:26:11] I know what things I may encounter that I could put myself into a state of ketosis within 20 to 30 minutes before that, to me, just made the amount of possibilities just open up widely.

[00:26:27] **Mike Chesne:** And that's the way it seems to me, it seems very simplistic. Like I said earlier, it's perfect sense to me, obviously it's a little, I'm a little biased when I look at it, because I've been studying this for so long, it makes perfect sense to me as a former soldier, Hey, before I go out, I definitely want this on board.

[00:26:49] I want to have. At least a nutritional level of ketosis on board when I go out in case something happens, what if I fall getting out of a truck, I fall and hit my head, what if I, what if I do, what if I am in that unfortunate place where there's a an explosion or whatever it is, and I get a head injury, what if I'm playing a football game or rugby game or soccer and the ball hits me in the head, or I, I get hit head to head with a helmet to helmet in a football game.

[00:27:17] Those things cause head injuries. Even if they're small micro concussions, those things add up over time and those That's, those are the things that if you keep yourself in some mild state of ketosis, even it's through exogenous ketones, that can't hurt. That's the other thing. It can't hurt you. Do we have definitive clinical data in humans through randomized controlled tests?

[00:27:46] No, nobody does. But it can't hurt you. It can only help. The only person I would suggest that you didn't take a ton of exogenous ketones if you're a type 1 uncontrolled diabetic. I'll tell you now, probably not the best thing for you to do is go out there and raise your ketone levels up if you don't know how to control them on your own.

[00:28:13] **Dr Mike T Nelson:** Yeah

[00:28:13] **Mike Chesne:** I agree with that. That person probably shouldn't be playing football. They probably shouldn't be in opera, operating in combat. There's some other things that they probably shouldn't be doing if they can't control their insulin levels anyway.

[00:28:24] **Dr Mike T Nelson:** Yeah. And that's good. The insulin kind of serves as this cross check on the system too.

[00:28:28] And if you're a type one and you literally have zero endogenous, so you're not, body's not producing only insulin. You don't really have this cross check going on, but in healthy people, we have that sort of. Yeah. And that's similar to my thoughts too is that for years for kiteboarding, I've taken ketones with, I've used all sorts of other brands and I use Tecton, but just, I used to have a whole bunch squirreled away in my bag that I'm like, if something really bad happens, hopefully I don't get dropped out of the sky 20 feet on my head.

[00:29:05] Like I hope everything goes well. But if that happens, for me personally, this again is my personal choice. I'm going to put myself in a state of ketosis as high as possible, as fast as I possibly can. I'm probably go fasting. I'm probably going to start doing a ketogenic diet immediately. I literally already have my neurologist on speed dial who I can literally personally know and call and be like, Hey buddy, like, when can I get in?

[00:29:27] But in that it sounds to some people listening to probably weirdly Like I'm gonna worry some, but at the same point, I think if you're doing any activities that there's a fair amount of risk involved, it doesn't take that much time and effort to just think forward at least a little bit and try to be a little bit more prepared for something.

[00:29:45] And you hope it never happens. You hope you never need it, but like having airbags in your car, you hope they never, hope you never need them. But if they're something happens, it's good that they're there and that, that they work.

[00:29:56] **Mike Chesne:** Yeah. And I think that's a great analogy that you put.

[00:30:01] The airbags, the other thing is your seatbelt when you get in your car every time. I do it every time I get in the car, I put my seatbelt on it's a safety measure. It's not hard. It's not that much to do, but you do it every time.

[00:30:13] **Dr Mike T Nelson:** Yeah. Yeah. Yeah. And about the military stuff, I had to ask, cause we were in a meeting once and you, I had mentioned something about the I worked on my master's was in the active device system, which was this big microwave transmitter in front of this little monkey head that I did a bunch of computer modeling for.

[00:30:31] And You had mentioned something about you had some experience with that. So I was always just curious if it was anything you could say publicly, or if it was just some interest you had in that particular system, which is, this is a small bunny, bunny hole.

[00:30:48] **Mike Chesne:** It just, it was a project that I had some familiarity with back in the late nineties. I had done that was, I was extremely fortunate in my military career. Just was, I spent 10 years plus in the fifth special forces group at Fort Campbell, Kentucky. And one of my jobs while I was there is I was on a what was called a special projects team.

[00:31:11] And that team's job was we worked directly for. Special Operations Command as the liaison between DARPA, Defense Advanced Research Project Agency, SOCOM, and whatever new projects DARPA had that were based on specifically for special operations. We were the on the ground operators that tested all of that equipment.

[00:31:38] There were a lot of those programs that. that needed to be tested out. So, if there were security security systems that were in different places if they were in a a power plant or an airport or wherever it was, those systems were in place and they needed to be tested by somebody.

[00:31:57] And so that was sometimes part of what we did was to test those systems out using all the technology that we currently had. And some of those systems were, out anti radar systems, anti whatever they were, anti movement systems, seismic systems, thermal, night vision, all of those types of systems.

[00:32:15] And we had, we tried to use countermeasures to defeat those kinds of things. And so that was part of my job. And it was, Absolutely incredible. Very it was one of the things that got me involved and let me learn about what

DARPA is and how it works and who the people are that work there and how their systems work.

[00:32:32] So it was a quite incredible, but that was one of the things it was a project like that. It may not have been exactly what you're talking about, but there were many systems like that, that we did test and do countermeasures against. So, yes.

[00:32:45] **Dr Mike T Nelson:** That's fascinating. And it was an

[00:32:47] **Mike Chesne:** absolutely fascinating job.

[00:32:49] It was a group of, and I will tell you some of these people there are literally books and movies made about them right now. I won't tell you any of them or any of that stuff, but there are literally books and movies that have been written and made about these guys that were on that team with me at the time.

[00:33:06] They are incredible human beings, absolutely American heroes. So good people. And that's some of those guys did that.

[00:33:15] **Dr Mike T Nelson:** Yeah. Oops. It froze for a sec there, but I think it'll come back. But yeah, a lot of those people you'll never hear from, you'll never know what was actually done, which to me is crazy. And if people are more time, they can look up just the projects that DARPA has declassified. And just the.

[00:33:35] The things they're looking at, I can honestly say in that meeting that I was presenting that years ago, I was by far the stupidest person in that room by like a long shot, like these, the amount of questions and the things that these people were asking in that room, like even now I've had luxury spending, being a lot of rooms, a lot of smart academics, like I can easily say by far in a way that was the highest.

[00:33:57] intellect in one room I've like ever been in my life. It was just bonkers.

[00:34:02] **Mike Chesne:** It is absolutely humbling sometimes to sit down. The good thing what we brought to the table, which was was incredible was a person the tactical person on the ground's perspective of what they were doing and what they were working on.

[00:34:15] So I'll give you a quick, really quick story. We were working on a project. It was a night vision device project with I think it was MIT. So they designed a new thing. It was a fused thermal and IR night vision device. And it and they said, Hey, this is great. We're infused these two things together and you'll be able to see color night vision, all this, and I said, Hey, that's great.

[00:34:37] Let's go look at it. They said the bad thing is the computing program the computing software and hardware that needs to go behind it. It takes the tractor trailer load full of computers. Okay. So, we went up to have a meeting with them. And so I go up and I'm wearing a, a suit and and everything, but I bring my, my, my rucksack is what we call my backpack with all the equipment that we normally carry or what we call mission essential equipment brought that with me.

[00:35:06] And we go to the meeting and I have to, I bring the bag and I set it there. I go early so I can set the bag without them seeing it and I've covered up. And so we have the meeting. And and that after the meeting goes on and I, so I take all the equipment out of it and I lay it on the conference table and I say, okay, here's everything that we carry.

[00:35:24] All of this stuff I have to have. This is, batteries radios, ammunition, whatever it is, all the stuff I absolutely have to have. Here's the stuff that I can give up, an extra set of clothes, the meals that I've already cut down as small as I can get. And, the water rations that I have for the two days or three days, we're going to be out there, whatever.

[00:35:45] Here's the stuff I can cut down because they can maybe resupply some of this. Now, tell me how I'm going to fit a tractor trailer load full of stuff in here. Here are my current night vision devices. They need to be this big. Now, and talked them through, here's our full mission profile and here's how we do, here's how we get there, here's how we get, how we do our mission, here's how we get out.

[00:36:07] Now, how do we fit what you guys are doing into here? And it was like a big giant light bulb went off over some of these passages. Ah, okay. They actually did it after many years. I was long gone after they were able to do it. And they got it down to where this is like few four tube device that guys can wear on their helmet.

[00:36:28] But it interesting because you have to sometimes say, Hey, step back. Let's use some common sense here. A guy can't carry a tractor trailer with

him when he goes on it. You have to have something that's going to, but it has to start somewhere.

[00:36:45] **Dr Mike T Nelson:** Yeah. And that's, it's pretty That's what I think it was fascinating about DARPA too is that they don't necessarily put Limits on how to get it done.

[00:36:51] So when I was at the meeting, I asked him the guys that said, yeah, on the very off chance, I get a contractor, do some research with them. What is the thing I should not do? What is the best way to just, lose your contract? And he told me, he's not showing them all your failures. And I'm like, what the, what are you talking about?

[00:37:08] He's not showing them all my failures. He's yep. Because if you can show why you failed and what you learned from it, then he's that means you're doing an iterative process. Like you'll eventually probably get somewhere and they'll give you more money. They don't really care too much about that.

[00:37:22] The projects are normally funded. But he's if you spend all your time theoretically thinking of stuff and not testing anything, not creating prototypes, not running any experiments, he's they'll shake hand you instantly because they know that you'll never get anywhere doing that. Yes, you need to do some of that work.

[00:37:38] Yes, it needs to be up front. Yes, you need to look at the literature, but he's they're trying to solve problems that are three to 10 years or more out. He's like, all the easy questions have already been answered. Those are all done. Like this is all the hard stuff, .

[00:37:51] **Mike Chesne:** Yeah. Like you said, you're sitting in a room full of some of the smartest people on the earth.

[00:37:55] Yeah. They've already answered all the simple questions. Yeah. They're already done, that's already sitting on the shelf somewhere. They want you to answer questions that they can't figure out. Yeah. The only way to do it is to fail. Yeah. Learning, learning is done. I've heard this before.

[00:38:11] From two ways you either fail or you, or through pain. Yeah. Those are the two ways you learn , so. You either fail or you hurt yourself, or get hurt doing it. That's how you learn.

[00:38:24] **Dr Mike T Nelson:** And fast forward, backwards, you said there was a longer story about why you were looking at a different ketone molecule instead of just going with the one that had been originally developed by Veatch and everyone else.

[00:38:36] **Mike Chesne:** The other thing is you could only the one that they, the one that's on the market now, outside of Tecton, the Tecton ketone molecule is. It has a limitation of how much you can take, how many servings a day you can have of it because of the way that it breaks down in the body. All of their molecules, the ketone esters that are out there now are, I don't want to say all, there's probably a couple that I may not know everything about, but the majority of the market share.

[00:39:09] Majority of the market share are beta hydroxybutyrate that has been conjugated with 1, 3 butanediol, which is a diol. It's a, an alcohol, an ethyl alcohol based an ethanol alcohol based product. And that's what they're conjugated with. You have to conjugate beta hydroxybutyrate with something else in order to make it bioavailable.

[00:39:33] If not, it just goes into your system and washes right out. Your body can't use it. So, but the 1, 3 butanediol, as it breaks down and one of the byproducts of, or one of the products it breaks down to in the body is beta hydroxybutyrate. So it, it has benefits, absolutely, but it also breaks down and has some other

[00:39:54] problems.

[00:39:55] **Mike Chesne:** I'm going to call it issues and people can say whatever they want, but it has CNS depressant issues like other alcohols, like other ethanol, ethyl alcohol types have. So there's limitations to it. And you can look through their toxicity ish literature, you can look through all the literature, and it's out there.

[00:40:15] There are, there's papers that NASA has looked into, there's other things that are out there. There are some limitations. And you look through their GRASS data. You can only take so much. And so it limits how much you can use and what you can do with it. I wouldn't put it in, in, in stuff that you take every day or use every day, or something that somebody could potentially take too much of.

[00:40:38] If you put it into a protein bar or into a gel or a gummy that somebody might take too many of every day. So, my thoughts were, hey, let's

find something that the human body can break down and use for energy anyway, and conjugate it with that. And again, I, I've, I had this conversation with, my, my partners at the time and they, did not want to even think about it.

[00:41:02] No, let's not go back to the drawing board. Let's keep going. And so I said, okay, let me see what I can come up with. So I came up with a different idea and design and took that to Georgia Tech, Georgia Institute of Technology in Atlanta to their science department and just contracted them and said, Hey, can you take the molecule that I've designed and make me a sample of it and let me test it and see how it works.

[00:41:33] And they were able to do

[00:41:34] it.

[00:41:36] **Mike Chesne:** We're on 2.

[00:41:37] 4 5G.

[00:41:39] **Mike Chesne:** I'll switch

[00:41:39] to

[00:41:43] **Mike Chesne:** 5G.

[00:41:45] I apologize for that, that might have been on my end,

[00:41:47] **Dr Mike T Nelson:** I don't know what happened here. But, we'll stitch them together. And, you were saying you wanted to come up with a new molecule. That you wanted to combine the BHB with something your body could use.

[00:41:59] **Mike Chesne:** So, Wanted to combine it with something that the body could use so that you could take more than just two servings a day and you can combine it with anything that you want.

[00:42:08] So there wasn't any limitations and also that didn't cost so much to make. So I took it to Georgia Tech and to their science department and had them, did a simple contract with them. Hey, can you make me some of this? And they literally make me, made me one milliliter, took them six months.

[00:42:26] They made me one milliliter of it, had it tested, and it was exactly what we wanted. So it was a specific design. So the way I looked at it is I said, look the way the body works is as if you have a molecule that's designed and it has three positions on it, the body normally cleaves off the first.

[00:42:47] And the third position and then the two position on the molecule stays intact longer. So it's theoretical, obviously, like most things in science until you prove it. And I said, so we can to where the majority of the molecule it's in the two position. Theoretically, that's the one that's going to get used the most, and your body's going to use it and absorb it quicker.

[00:43:12] It'll be more bioavailable, and they were able to design it that way. Of course, when they did it through a chemical process in the lab, so then it took me from the time they did that, Another five years to take that process from there to a natural enzymatic process that is uses no harsh chemical.

[00:43:34] So now it's naturally made. We start from, raw material of basically waste material of sugar cane or beets or whatever it is, corn baggage or corn waste, whatever it is, but some kind of bio material. Right through an enzymatic process and then come up with our raw material to start with.

[00:43:54] So, all natural process. And what we ended up with is a endogenous or an exogenous ketone ester that can be taken at pretty much any dose that you, any serving size or portion size that you can take, that you could possibly take. Our toxicity data came back at 200 times what we have in our current can offering, which is 10 grams.

[00:44:23] 200 times that is what you could Take in, and that's just, that's the most that our animal models could physically drink every day. That's the most that they could get into their system in a day. And there was absolutely zero adverse effects on, in any system that they had. And we published that data. In in Nature magazine last October a very reputable publication so good, really good data that came

[00:44:54] **Dr Mike T Nelson:** out.

[00:44:56] And so I believe it's public knowledge to say what the molecule you use which is BHB and it's bound to glycerol, correct?

[00:45:05] **Mike Chesne:** It's a glycerol bound BHP mark.

[00:45:10] **Dr Mike T Nelson:** And did you get the idea from, so if people look at like fat in the body, they think of fat and they, so the structural, you've got this glycerol backbone and then you've got these kind of three fatty acids that come off of it.

[00:45:24] And so when your body needs to use fat, there's a little enzyme that goes in and it clips off these basically these three positions. You're left with free fatty acids, you're left with glycerol. So was the idea similar to that, but you're trying to replace some of those fatty acids with a BHB molecule?

[00:45:42] **Mike Chesne:** The thought was, and it was pretty simple. I was thinking of man, MCTs are great. And they help raise. Raise ketone levels in the body, but it's so small, triglycerides have GI issues. So what if I only use a monoglyceride versus a triglyceride? That's where it hit. And I was like, okay, let's try a single glyceride and glycerol.

[00:46:08] This is monoglyceride. Let's try it that way. And that's where the idea came. Oh, very cool. It came from thinking about MCTs or triglycerides and single glycerol came from, glyceride came from that. So that's where the thought process started from and bounce that back and forth with our, with a good friend of mine, Michael Schmidt, who's our science lead science advisor.

[00:46:30] And, one, again, you talk about being in a room with a bunch of brilliant people. Yeah, he's a smart dude. My IQ level raises just being in the same room. Yeah,

[00:46:42] **Dr Mike T Nelson:** that's awesome. And People have heard me talk about this on a podcast before, but years and years ago, I got a sample of a 1, 3 butanediol.

[00:46:50] I didn't know what it was at the time, so I won't say what the connection is, but a guy who was running a supplement company that doesn't exist anymore. I was good friends with him. He's he would send me stuff to try all the time. Calls me up and goes, Hey man, I got this new thing. You want to try it?

[00:47:04] I'm like, sure. What is it? You're like I can tell you it's grass safe. It's a liquid. It's non hormonal, whatever you do, like it's going to taste bad. Do not throw it up and do not spit it out because it is ungodly expensive. And he sent me this little vial about this big. He spared no expense by going to Home Depot and getting little good grips, little small something you'd measure a glue in to take it.

[00:47:29] It shows up in the mail, no COA, no labeling, just a FedEx thing. And at the time I had talked to him off and on for seven years, friends of friends or whatever, but I had never met him in person. And so I'm in my kitchen, I'm all ready to take this. And I'm like, it's not too much of a smell to it.

[00:47:46] And I'm thinking, I'm like. Is this like an elaborate six to seven year like catfish scam to get someone to poison themselves or All these horrible thoughts and then I try it and i'm like, oh my god this tastes Horrendously bad because there's no flavor and there was nothing in it at all And all I remember is him telling me like just don't throw it up, but i'm like over at my sink in my kitchen Just oh this I've never had jet fuel, but that was like the first thing it reminded me of.

[00:48:16] There's not, there's things you've had in the supplement industry that tastes bad. There's other things where you, your first thought is literally, did I poison myself? Yeah. And in turn of the letter was 1, 3 butanediol. Yeah.

[00:48:30] **Mike Chesne:** It's it's the manufacturing process and what it is. What is a, that's what it is.

[00:48:36] It's a diol. It's a It's going to taste bad. It tastes, to me, like a mixture of jet fuel and the peatiest scotch. Oh, yeah. There's a weird

[00:48:49] aftertaste.

[00:48:50] **Mike Chesne:** That's what it tastes like to me. If you took a heavy, peaty scotch and mixed jet fuel in with it that's the taste that you get.

[00:48:59] **Dr Mike T Nelson:** Yeah. And even in the industry, we won't name names, but people can easily look around and find Yeah. Certain companies selling it for performance enhancement, which you could argue, maybe if combined with another ester, maybe you keep the dose low, maybe literature goes back and forth on that. And then you've got other groups that are literally selling it as an alcohol alternative.

[00:49:18] And the same product, the same it's the same product. Like you can look at the label, like you don't have to believe me. Like you can just look at the label and look at what the ingredients are. And like any sane person has to scratch their head and go hold on. This is the same molecule here.

[00:49:34] Like what, what's going on? I'm going to do this and also

[00:49:37] **Mike Chesne:** get me drunk. Okay. I'm not following. Yeah. Yeah.

[00:49:42] And just.

[00:49:44] **Dr Mike T Nelson:** My end of one experience is at low doses. I do feel some benefit. I can't say I've noticed the benefit with exercise. Some days I'm on cognitive stuff I do, but I've noticed rapidly. If I start going above one dose into two doses, I definitely do not feel like I want to train.

[00:50:01] Like I feel like I maybe was at the bar a little bit longer than I thought. It's not like the same sensation. It's it's different, but it definitely wasn't something where I'm like, Yeah, I'm going to go do a heavy row or lift some heavy stuff now. It was very, yeah, interesting, to say the least.

[00:50:19] **Mike Chesne:** And that's one of the things that about our product and our Tecton molecule. It's, we wanted to design it and build it so that everybody could have it. We're working hard and we will get it to where it's affordable for everybody. That's our mission. is to get this thing to where our manufacturing process gets to where this is affordable for everybody, not just people that can afford 30 a dose.

[00:50:44] I'd like to get this to where everybody in the U S and the world, eventually, hopefully, that's my goal, but I want it to be affordable to everybody who could buy anybody who could go in and buy smart water or a Fiji water in the store could buy a Tecton and use it. So If you could do that, I want this to be cheaper than going in and buying a Starbucks coffee, which is what it is now.

[00:51:10] It costs about what it costs to buy a Starbucks coffee, but I'd like to have it to where it costs the same as buying high end water. So, and that's what we're working on. That's our goal, in the very near future is to get it somewhere around there. So that's what we want.

[00:51:23] And look, it is. It costs a lot to make this stuff. It's it, this has taken eight years of research and development. There's a lot that's gone into it, but what our goal is to get this to as many people as we can so that the benefits of. Increased cognition and neural protection and the, just the thing of feeling better and the great benefits that you'd get from being in ketosis and from having ketones on can be for everybody, anybody who has any kind of a neuro metabolic disorder anybody who has, any kind of a a metabolic disorder can use this to As us, as an adjunct to what they're normally doing.

[00:52:09] I'm not telling you this is going to cure or treat any disease. Cause that's not what it's for. This is just like taking cough medicine to make you feel better about your cough. It's just something to help you. It's not something that's going to cure or treat anything. It's just something to help you out.

[00:52:28] **Dr Mike T Nelson:** Yeah. And I think that what's fascinating to me is one that if you can get the price down, just the Availability, it opens up to whole different markets. Like I even just think of a lot of clients I work with, some military, some shift workers, ER docs, et cetera. Like I've recommended to that, to them on the back end of their shift, because like you, you want something that has a little bit of a cognitive thing.

[00:52:52] You're probably fatigued, especially if you're working shift work, you've done it multiple nights in a row, but you also know you got to go home and sleep in three hours because you have to go like repeat this whole cycle again too. So it has, I think these kind of. Interesting benefits that other molecules don't really work.

[00:53:07] Yes, caffeine is a benefit. Sure. But caffeine is also extreme negative. If you're trying to go to sleep in three hours, too, there's not a lot of things that will what I equate it to getting you back to baseline or a little bit above, but don't have a high cost on the back end that you have to pay later at the same time.

[00:53:24] **Mike Chesne:** And, I'll tell you I'm like most people. I love caffeine as much as anybody else. I have a couple every day, but I have them in the morning because if I drink them in the afternoon, I'm up till midnight and I don't like being up till midnight. So, I'm, and I'm not opposed to in the future, maybe even having an offering.

[00:53:42] from Tecton. That includes a little bit of caffeine with our thing, but that would be a different use case. That would be something you would use in the morning or before a workout. Not something you use in the afternoon or at, like you said, at the end of a shift because ketones don't keep you up. They don't make you jittery.

[00:54:01] They, you can drink one and then go right to sleep. It works well and helps with your sleep cycles.

[00:54:08] **Dr Mike T Nelson:** Yeah, and I've been lucky enough to, play around with it quite a bit now. And what have you found for dosing? Anecdotally, what I found is

[00:54:15] 20,

[00:54:16] **Dr Mike T Nelson:** 25 grams. And then I weigh about 240. That seems to be the sweet spot.

[00:54:23] And I've noticed, The more fatigued I am, the more benefit there is. Like I don't, like if I'm really well rested, like everything's on par for me personally, I don't notice a huge boost above baseline. Again, I'm not elite level athletes. I'm probably not going to even be able to detect that, but on days where, work has been busy, sleep a little bit less training volumes, high.

[00:54:44] Like that ability to just get back to baseline. To me, I've noticed that like kind of time and time again, which was in all honesty, surprising. And I've noticed for myself, 20 to 25 grams appears to be about the dosage. I don't know what you've noticed.

[00:55:01] **Mike Chesne:** It is it's amazing that you say that because that is absolutely it.

[00:55:06] And all of the clinical data backs up exactly what you said. Yeah, it matches that too, yeah. So we've. We've gone, I've gone all the way up in the clinical data testing all the way up to 60 grams and the, it peaks at about 30 so 25 grams is about where your sweet spots going to be. So 20 to 25 grams is where you're going to get the most benefit out of it, you start wasting the ketones after 25 to 30 because you're just not going to get any more benefit out of it.

[00:55:35] That's where you're going to get it. And you are absolutely correct with. If you're already feeling good, this isn't something you need to take at eight o'clock in the morning when you wake up rested and everything else, it's just unless you're fixing to work out heavy. It's just not something you need to take.

[00:55:54] This is something you take for me. I take it at 11 when I'm, I haven't had anything to eat yet and I want my fast to last till 2. That's when I want to take it for that purpose. Or. I take it at one. If I've eaten breakfast, I'll take it at one because I'm starting to get tired, starting to feel fatigued.

[00:56:13] And it just in 15 to 20 minutes, I start to feel that, Oh, I feel great. I'm ready to get back down and start working. And my brain starts really clicking. If you're tired and fatigued, that's when you get the most benefit out of

it. If you're starting to slag or lag a little bit, that's when you get the benefit out of it.

[00:56:34] If you're already feeling rested and good. You're really not going to feel anything from taking the Tecton. Are you going to get benefits? Absolutely. Are you going to feel them? Not at all, but that's the sweet spot is about 20 to 25 grams. for people, especially for people who use it a lot. You get good benefits at the nor at that 10 g dose you do, you get benefits from it, you get good cognitive benefits from it.

[00:57:00] But that sweet spot, especially for people who are, I'm a little over 200. People that are bigger guys. You're well over six foot. You're a big you're a big man. So 250 pound people, it, it takes a little more to, to get more benefit out of it. Normal, normal size, 200 pound men, 10, 10, 15 grams are going to get you some benefit, but that 20 to 25 grams for an athlete.

[00:57:24] That's what's going to get you what you need.

[00:57:27] **Dr Mike T Nelson:** Yeah, the other part I've noticed too, when I was kiteboarding a lot, I go out and do maybe a two to three hour session and then we'll wrap up here and I would come in and there's a point where like physically I could still ride, I could still do fine, but trying to learn new things, like especially riding in waves and stuff, my brain was just cooked like cognitively, went back, had some fluids, drank two cactons and like 30 minutes later I went out and rode again for another two hours and I felt like My brain was actually working better again, like almost like at the beginning of the day which I was surprised about that.

[00:57:59] But again, it makes sense. Maybe you had a fair amount of fatigue from things you're doing, ketones can then help at that point. So it again, gets you back to baseline.

[00:58:07] **Mike Chesne:** And the other thing just a quick note. Yeah. I know we're getting close on time, but the other quick note is, Ketones cross the blood brain barrier very quickly.

[00:58:16] They're small molecules and they're one of the few molecules that really cross the blood brain barrier really quickly. So you're getting ketones into the cells of the brain very fast. And the way that this molecule was designed with those BHP molecules sitting, the majority of them on that two position in the on the molecule.

[00:58:35] Those are the BHB molecules that are going into the brain, then being broken down into, that the BHB being broken down into acetoacetate, acetoacetate, and then to acetyl CoA, and then to the 2 acetyl, and then into the TCA cycle. That very simple three step process. And you're in the TCA cycle and you're making ATP really quick, very efficient, and it's going into the brain very quickly.

[00:59:03] So I think that has a lot to do with it to the ability for it to cross the blood brain barrier quickly get into the cells quickly and be an efficient energy source.

[00:59:12] **Dr Mike T Nelson:** Yeah, that's my last question is, I've noticed just on myself and some other people we've had tests to that. Their blood ketones definitely go up, but they don't seem to go up as high as some other products, which I think can be confusing for people, because especially in the biohacker space, a lot of it is just, oh how high is your blood ketones get?

[00:59:33] That's this Marker, but yet if they're in the blood, they're not necessarily being used, right? So it's this weird sort of adopted surrogate marker and I understand there's a place for it But and we've had many chats to that If the molecule is getting pulled out of the blood and being used more like you have a big drain in your bathtub Like you're not gonna see that level go up As high and you still see you can measure by looking at functional outcomes.

[00:59:59] You still see the benefit in the outcome. So any thoughts on that?

[01:00:03] **Mike Chesne:** And I think a lot of that goes back to a little bit of the explanation. I gave you earlier the way that the molecule was designed with that being in the position it is on the molecule. When it's breaking down, remember the parts that are getting cleaved off, that's what's circulating in the blood.

[01:00:21] The other part is what's getting taken up into the cells almost immediately. So, a lot of the BHB is not being measured in the blood because, heck, it's going straight into the cells. So, It's being utilized right away. So it's quickly being utilized by the body. So you're not going to see that residual being in the bloodstream.

[01:00:43] So if you look at our pharmacokinetic data and the way that the linear pharmacokinetics work, you see a spike in the BHB levels at, between 15 and 30 minutes and it spikes up. And the non encapsulated now we have some great technologies coming out and I hope we can have another chat later on for me, but it spikes up and then it just slowly comes back down and it follows a

perfect linear curve the way that pharmacokinetics are supposed to linear pharmacokinetics are supposed to, but that's what's circulating in the bloodstream and it slowly comes back out.

[01:01:16] And, after about three hours, you use it all up. But the majority of it gets used very quickly so that your body is already having the benefits of what's going on. The cells are using the product and it's not just sitting there circulating through the system until your body can use it. So I would like to see, and this is some clinical data that we are going to do.

[01:01:41] Let's mark it. Let's do some marks. Tracer study. Yeah. Do a tracer study on this, and let's see where it's at. Let's see where it's going. And I'll tease with this, but we've done some preliminary work on this, and we know where it's going. And hopefully in the next few months, I'll be able to, we'll have some papers out there and you'll be able to see some really nice photos of where the body, this is lit up and may answer some of the questions a little bit better.

[01:02:08] **Dr Mike T Nelson:** Yeah, no, that's awesome. And I haven't seen that data, so I'm not making any predictions on it, but if you look at previous data. It's fascinating because the cardiac system loves using ketones. Like the cardiac system can pull lactate, pyruvate. It can pull every few possible because your heart has to keep beating.

[01:02:25] The brain seems to be more selective to glucose and then ketones are definitely the air quotes backup system. But if you take a concussion hit, glucose metabolism gets definitely hosed up. So ketones can play a role there. But it's just fascinating to me how some of the work that's been done shows that pretty much every cell in the body can use ketones.

[01:02:45] And like you said, if you go back to this kind of starvation condition, You run enough fat through, ketones are a byproduct. This makes sense, right? It makes sense that your brain can use ketones, your cardiac system can, your muscle can. All that just lines up then.

[01:03:00] **Mike Chesne:** Yeah, there's some great data that, Dr.

[01:03:02] Veech, who was a brilliant scientist we lost a brilliant scientist when he passed away a couple of years ago, but absolutely, the Krebs cycle could have been the Krebs Veech cycle if people understood that, he was a big part of that research but, yeah.

[01:03:15] He put out he, he published a study and part of that study was on the hydraulic efficiency, cardiac hydraulic efficiency with exogenous ketones. So if anybody's interested, look up Dr. Veech's work on cardiac efficiency and it was done in animal models, but the cardiac efficiency of exogenous ketones on the heart.

[01:03:38] There are some incredible results that the heart muscle has and the heart and the benefits that the heart has with ketones. So, this is just a great, it's a great molecule. Like I said, ketones are evolution's answer to an energy crisis. And if you're having cardiac problems, that's an energy crisis.

[01:03:59] If your brain needs energy, that's an energy crisis from an injury or whatever else.

[01:04:05] It

[01:04:05] **Mike Chesne:** stands to reason that. Ketones are a good answer or at least a an answer to those.

[01:04:12] **Dr Mike T Nelson:** Yeah, I know that you're looking at medical applications for this, which we won't get into, but hopefully in the future if people are interested, they can contact you because I think there's a lot of applications for consumers for pathologies for, frank medical conditions too, that just makes it super exciting too.

[01:04:31] And obviously we'll have more data along those lines we can share in the future. Absolutely. Awesome. Any last comments? And thank you so much for your time. This has been great. I really appreciate it.

[01:04:42] **Mike Chesne:** Really, just last comments are thank you. Mike, I appreciate everything you do and thank you for having me

[01:04:47] **Dr Mike T Nelson:** on.

[01:04:48] Yeah. And thank you so much for starting it and coming up with a different unique molecule and all that stuff. Like we said, in the podcast is not easy. If it was easy, there'd be a bunch of people who've already done it and there's only a handful. So I appreciate all the time and effort that went into it.

[01:05:02] It's one thing to have an idea on a napkin. It's another thing to actually see that idea all the way through to fruition and going forward. So that's amazing.

[01:05:10] **Mike Chesne:** Yeah. And look, one of the big things is obviously this isn't me. I didn't do all this on my own. This is a great bunch of people, teams of people working together.

[01:05:23] The people who have invested in this for years and really never given up on, on the idea and the, the dream of what we're doing. So again, don't please don't think that I'm taking credit for this because this isn't just me. There are. Lots of people behind this, especially, our great investors who have been very patient with us and have worked really hard.

[01:05:44] And the team that's behind us working hard to help do this every day. So I want to thank them and thank you Mike for all the help you do with us.

[01:05:52] **Dr Mike T Nelson:** Yeah. And, I can honestly say everyone I've interacted with there has been great, like super knowledgeable, super passionate about what they're doing.

[01:05:59] And it's been, yeah, it's just been a pleasure. I've had the luxury of working with some other companies, and I can't always say that, so I'll leave it at that. So thank you so much, I really appreciate it, and I appreciate all your time today, that was amazing. Alright, thank you. Thank you.

[01:06:14]

[01:06:15] **Dr Mike T Nelson:** Thank you so much for listening to the podcast. Huge thanks to Mike for all the work he's done over the years there at Tecton. And for his military service and everything he's done appreciative of his time to come on the podcast here and check out LMNT. Go to drink LMNTy. com forward slash Mike Nelson for all the information there.

[01:06:38] It's by far my favorite electrolyte beverage. And then the physiologic flexibility certification opens March 18th, 2024 to go to physiologic flexibility. com. It'll be open for exactly one week. through March 25th. I will not plan to be open again until later this fall. So this is your chance if you want to increase your ability to increase recovery, increase your ability to withstand the different stressors.

[01:07:09] and just generally be much harder to kill. So go to physiologic flexibility. com. Thank you so much for listening. Really appreciate it. If there's someone you think may enjoy this podcast, please forward it to them. Talk to all

of you next week. And if you're at the real coaches conference, hit me up. Hope to see you there.

[01:07:29] Well, that was different. Yep, lousy, but different.

[01:07:33] **Nancy:** This podcast is for informational purposes only. The podcast is not intended as a substitute for professional medical advice, diagnosis, or treatment. You should not use the information on the podcast for diagnosing or treating a health problem or disease or prescribing any medication or other treatment.

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