Unlocking Longevity: Ryan Smith on Epigenetics and Personalized Health | Ep. 56 Transcript

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Introduction to Epigenetics and Longevity

The things we can do with this data are incredible. And we tell you when you're going to die with 92% accuracy within a five year time period. But not just death.

We can predict when diseases are coming just from a drop of blood. Meet Ryan Smith, founder of True Diagnostic and a leader in epigenetic testing. His work deciphers how lifestyle and environment influence our DNA.

offering new pathways to extend health span. Stay tuned for a compelling conversation on aging and wellness. So hold on one second. You say that you could predict five years in advance before someone's going to die?

We're not making claims. We can predict it highly accurately. What people don't realize is age is the biggest risk factor for every chronic disease and death.

If everyone decreased their biological age by seven years, we could cut the incidence of disease in half. 50% of people would no longer be sick. I want to understand what epigenetics are.

Every cell in your body has the same DNA. Epigenetic so is the reason that all those cells behave differently. What causes gene expression change? Your body.

Has a extremely complicated mechanisms to regulate this. And I tell people, if you have problems with regulating this DNA expression, you just don't survive.

Dude, how many books you read a day? Where do you get this information? Because this is not just information that's like readily available. Well, what's the next big thing for Ryan Smith over here?

You know, Welcome to another episode of a Healthy Point of View podcast. I'm your host, Sam Tahata. And like always, we're bringing experts from all over the world in the health, wellness, and beauty sector.

Ryan Smithu2019s Background in Peptides

So today we have someone who's been in field for a very long time. This is one of the initial peptide gurus who really brought peptides here to the United States with his team in tons of research.

He's a peptide expert, but most recently an expert in epigenetics and then also all of the treatment modalities that come along with it. Today we have Ryan Smith here at the podcast.

Ryan, pleasure man. Yeah, thanks for having me. I've been a viewer of these for a little bit now, so happy to be on. And you've in the industry for awhile.

You've seen this industry Go from where it was basically nothing to all of a sudden, you know, You got this whole thing where like we got conferences every other week, maybe every week at this point, to be honest with you.

Yeah, exactly. It's hard to believe it's been over a decade now, which is crazy. Since my first introduction to things like A4M and a few other conferences, but it it wild how long it has been and honestly how much has changed as well.

Yeah, man. So let's talk about how you even got involved in this thing, because you're formerly educated in biochemistry, right? You went to medical school, and you said, you know what, I'm gonna go a little bit of a different

path.

I wanna know why you decided to go the path that you were in and how we even get where we're at today. Yeah, definitely. So I passed my step one in medical school.

For people who don't know, the first two years of medical are most of your training, your academic training. And I loved it. But it really quickly got to my third year in the clinical portion and treating patients and really feeling a little bit disheartened.

I think that anybody who's been in this functional medicine industry before probably has a similar story where they get a dissolution with the patient care they're doing, feel like they aren't making a difference.

Mine just happened really quick. And I just really felt like I was following a formula and really not helping people. And it wasn't super exciting to me.

So I made the very stupid financial decision at the time to quit and then really started to create TaylorMade Compounding, which was a compounding pharmacy with sort of the focus of really innovative pharmaceuticals.

So we started a lot of the peptides as you mentioned, you know, most of peptide people are using today, thymus and beta, the thimus alpha, BPC, all the growth hormone secreticogs.

We were really the first pharmacy to adopt, educate, and really scale that in a major way. Right. I mean you guys were it back then. And I was telling you backstage, it's like, Till today, I think I still have that catalog, which everybody considered it like the peptide Bible.

Yeah. You know, and you guys were really big into making sure you're educating people on all these peptides. But man, back then, you guess had every peptid you can think of.

Right. So you, guys, were doing a lot of research with the Peptides back that. Oh, absolutely. Yeah. The, um, you know, that was actually, uh, what got me to where I am even today is that we, we were, it was really a biohackers dream, right?

At that point, because we we're scouring the literature for anything that looked really promising, had really good phase two safety data, maybe it wasn't in phase three, but not yet FDA approved.

A lot of the things we were even doing then weren't FDA approved, which are FDA-approved now. So even just in the past few years, I've gotten FDA approval.

We were really off on guard testing out all these new molecules, but we also knew that at the end of day, we needed a lot research to make sure they were sustainable and you could do them for a long time in this industry.

And so we started to do a lotta that research, and it's actually what brought me eventually to some of diagnostics we're doing with True Diagnostic Now, sort of being able to figure out what works and what doesn't.

Yeah, so back then when you were doing a lot of the research on peptides, was that research here in the US? I think the U. S. had some research in like Austria or Australia or something like that.

Yeah. So Australia actually had a big market in some of these peptide even before the us adopted it. And even for that, Russia in particular has always been a leader for some the peptids, particularly the bioregulators and things of that nature.

The only thing that we did was to try and do interventional studies in a couple different patients. One of my favorite examples is you know, things like epitalin.

FDA Crackdown on Compounding Pharmacies

This is one of those bioregulator peptides. It was sort of done in Russia with Dr. Cavinson initially, but everyone was using it to increase telomerase and to increased telomere length.

Some of the studies showed 33% increases in telomial length, which is obviously a staple of any aging conversation that we have. And so we did some trials to see if it increased Telomero length and unfortunately we found it didn't, uh, But it's still a great product.

and one that has a lot of other benefits. But that was an example of some of the studies that we were doing and now applying it really in practice and see what types of benefits we could get.

Amazing. Yeah, man, I remember back then I was always researching things because I wasn't into bodybuilding as well too. And I remembered reaching out to you and you guys didn't have the compound available just yet.

Let me see if I can remember, it was GW something. I reached out you, and I said, is there any way that you can get this? Yeah, I can make it happen. Literally within like a few days I had it, you know, already sourced and I was just like, this guy, right?

He's just, make shit happen? Yeah. Absolutely. And exciting class of molecules, the GW one, five, one six, uh, PPA or Delta agonist for, for improvements in performance and they're great products.

But again, no one that was sort of bought by. a big pharmaceutical company and then just sort of abandoned, but still great therapeutic activity and one that we had some good success with.

So let's talk about when you were in the peptide world and you made that transition. There's a few things that ended up happening, right? And we see this frequently with a lot of these governing agencies with the three-letter words, what happened, you know?

You guys were going from, like you started from nothing to all of a sudden making revenues of like 80 million a year, and you guys are killing it. And then all the sudden, everyone's like, I remember, all my competition, where are we gonna get our peptides?

Where are getting our preptides, what do we do now? So I wanna talk about that because we're noticing a lot of these type of things happening now with some of the GOP-1 drugs, Like, gosh, man, I hate to say it on the podcast, but I got sued by Novo Nordics, right?

And finally, you know, getting finally knock on wood, i'm getting to a settlement with them. But, You know I get heat from all different directions myself as through liquid Vita.

So I know exactly how it feels, where you are coming from. so let's talk about that. Yeah, it was a crazy time. We talked about all the good stuff about it, right?

The meteoric success we had. I mean, we went, for me, as a first employee, to over 250 employees, I think, within two and a half years. Doing really great in revenue.

And I actually felt like we were helping people as well. A lot of really happy patients, a lot really of happy physicians. But we hadn't equally, sort of, meteored fall aswell.

So I remember taking my first ever vacation after working with TaylorMade. It was probably three and half year in. and I wake up to text messages basically saying hey you know the FBI is here and has gotten the building.

How did that feel when you heard like the F. B. I. is the only time I've actually dealt with the fbi is like when I was at the fire department yeah and they were like investigating somebody that we transported or something and even that it's just It's like it's not local police.

It is not like the county police, it is the FBI. Yeah, It was extremely, extremely nerve wracking. I mean, I think I just

went to panic mode. it was hard to even remember, i think.

i was in Colorado trying to ski and my trip was cancelled that day, and I was on a flight back. But it, was crazy. We had no idea that this was coming.

Just complete surprise. And really didn't know why either. we felt like we were doing things well and on the up and up. Um, unfortunately it was, uh, sort of just this idea that the FDA, um, and the justice department as well, we're, were super interested in the loophole that we were sort using, which was that, by definition, compounding drugs are not FDA approved.

And this is because, you know, if you need a pediatric dose, You're going to have to do it in a different dose. It's not commercially available. Or if someone has an allergy, for instance, are you going have do a, a formulation that doesn't include products that they might have an So the compounding has sort of been built in this to fit this gray zone.

And so we were sort using it as well to do really innovative things. That certainly was not, I think, what the FDA wanted.

Building True Diagnostic

Unfortunately, though, there's no laws against it. So that was one of the biggest conundrums is that there was certainly FDA guidance, but the guidance is not law.

And eventually, I think that they really were just trying to stop us from doing any of the peptide things. Essentially, all the revenue we were doing, we probably went to 15% of that overnight, just instantaneously lost the majority of it.

But the most frustrating part is that we was sort of, the only one that's happened to. Pharmacies all over the US, and are still doing peptides in a major way, And so it felt, you know, we were a little bit bitter, in the years coming, just to see everyone still being successful with the markets that we had sort of built.

But at the same time, your you're also super happy that those things are still available, because you've seen how much they've helped additional people, but it was a crazy time.

And eventually, nothing really happened with The Pharmacy outside of being not able to do the medications anymore. Unfortunately, my partner in the pharmacy got a felony charge for shipping B12 to California without a patient-specific prescription, which is unfortunate as well.

But overall, it was really just the end of peptides. Well, listen, anybody who understands about the different states, California's the one that's just like, man, they're looking to hit people over the head for something.

California is just difficult in all facets. Difficult with franchising, extra taxes on everything, even on your grocery bags. When it comes to all the medical stuff, like listen that one of the accounts that, or sorry, one the states that we have to sell our IV kits and packets, and it's difficult.

You know, like they're always upper ass California. So I get it, you know. But it's good that people can understand that. Now, when it comes to like, the FBI, what do you think, Snitch?

I have no idea. Even with all the records, I'm sure it might have been a competitor or you even see it now happening. pharmacies are you know getting a little bit contentious with each other because someone has chose to sort of follow some of the new guidance and others are not and some people think that's an unfair competitive advantage and so you see it even now so it could have been a number of individuals but the good news I think is one of big takeaways is that we're starting to see a bit more freedom in that area.

I think that the FDA still has this category list of what you can and cannot compound. But if it's not on the list,

generally there's no rule against it.

And now with some of the Supreme Court decisions limiting some the federal power, it looks like that a lot of states get to make those decisions now and makes them much more widely available for consumers.

Certainly, unfortunately, we were one of the biggest and one the first people to draw attention, but I think that it's now certainly a more sustainable route, and peptides are officially coming back, which is good to hear.

Yeah, I thinks so too. But listen, snitches get snitched, so we'll figure out who it did. And listen. One of things that recently we saw something that happened in the 503b space, One of the pharmacies based out of Texas, there was a guy that created a Delaware company and was reporting all of these other pharmacies out there.

So what is your input when it comes, because I'm a huge proponent of let's win together. And for me, when we're out here preaching like, hey, let us change the course of medicine, and we are all preaching that, the last thing we need to do is divide, ourselves and then allow Big Pharma or one of these other, you know, government things win over us, so what is your stance when it comes to this type of behavior?

Yeah, I'm exactly on your same boat. I think it's a little crazy to try and single out other people in the industry. One of my favorite things about the integrated medicine industry in this cash-based space is it is a really big space, but it still small within medicine.

It is. And I thing that most of the practices that exist here are single LLCs, right? There are physicians who Hang their own sort of plaque and get a brick and mortar location and try and scale their business.

But we're doing some of the most amazing medicine in this space and I can see it now. I could see the data on these diagnostics. And I think that the more cohesiveness that we have, the you know, more than anecdotes, right?

I think we all have these stories about, you now, how well a patient did on the therapy, and I that those are all incredibly powerful for us and the people that we serve, but I also think that in order to make it more impactful, we need to do it in a way that speaks to the regulatory agency, speaks the university researchers.

And so one of the things we've really tried to a true diagnostic is to really start building that data set with our integrative providers to then Do study collaborations with the Harvard ZL's of the world, the Stanford's, of a world and really show people how good the medicine actually is in this space.

So let's talk about that man. True diagnostics. What is true diagnostix? Yeah, so when I was in the peptide space, as I mentioned, we were always knew that the FDA might come knocking.

And so we were always looking for ways to show that these products worked because we we're seeing it, right? And one of the things that caught my eye during this time was these epigenetic clocks.

And these are sort of molecular diagnostics which look at your gene expression markers to tell you how you're aging.

Biological Age vs Chronological Age

It might sound at first like really esoteric or vanity driven, but What people don't realize is age is the biggest risk factor for every chronic disease and death.

And so if we can treat or postpone aging, we could have massive population level health impacts. So just to give you an idea, if everyone decreased their biological age by seven years, We could cut the incidence of disease in half.

50% of people would no longer be sick. I was really excited about testing a lot of the peptides with this new sort of clock measurement. And so I was just really waiting until there was interventional trials.

And really the fall to winter of 2019, the first ever intervention trial on these clocks happened. It was doing growth hormone, DHEA, and metformin. Sort of a combination, it was only nine people.

It was an extremely, extremely small cohort, but they showed anti-aging effects with just those three medications, those medications which our community does quite a bit of.

And so that got me super excited. I just flew to LA and knocked on the study author's door the next day. That was really the start of True Diagnostic where I saw the opportunity first to hit a need within the clinical medicine space.

All the physicians who are already treating aging just need a really good way to quantify it. But in addition to that, I. Saw the other potential of epigenetics.

You know, most people are familiar with companies like 23andMe and see the things that they've done. Um, but epi genetics is, is a little bit more powerful because it's changeable, right?

You can take a genetic test once across your lifetime. It never changes, it's the same in every single cell. It's sort of who you are, but with these epigenetics, you can change them.

Everything you do, your diet, lifestyle, even the amount of close social relationships you have, all impact the epigenex and also impact your aging. So we're gonna get more into that.

Ryan, as a biochemist, what is aging? Oh, I think we're going to need more than the time in the podcast to tackle that. And that's actually one of the most frustrating parts is that people don't have a unified definition.

Even researchers have been working here for decades. So it's a hard definition to say, but really, most people would classify it as the progressive decline of our bodily functions over time.

And how that happens or why that happened is greatly contested. But it's starting to gain a lot of momentum with true science. It's not just, you know, Ponce de Leon looking for the fountain of youth anymore.

it is a scientific endeavor and we're still trying to answer that, but it a process we are trying also slow. But we're making progress on it. So, okay.

You gave me your definition on what aging is. Now, earlier you said biological age. For the people, we have a lot of doctors that tune into the podcast.

And for the new ones who don't understand the difference between biological and chronological age, what's the different between both? Well, so we track chronological age as a relatively arbitrary number, right?

It's sort of the number of trips we've done around the sun. But we all know people in their 70s who look like they're 50, and we know the other way around.

Maybe people who have smoked and they might be in the 50s that look 70. And this is not abnormal. or doctors either, like even things like transplant decisions or whether or not you'll get a orthopedic hip transplant or hip replacement would be one of those things.

But the problem is that with aging being the biggest risk factor, we know that there's a molecular signature of this process too. And so that's really the difference is we want to measure your body's aging, not just the definition of how many times you've been around the sun.

Right, right. So, okay, so we know the difference between biological age versus chronological age, which now we're getting into more of the science of it.

And now, the last thing that I kind of interrupted was talking about epigenetics. Yeah. Mm-hmm. We see so many people offering genetic testing and this type of genetic test and then this specialized epi-genetic testing.

How Epigenetics Controls Gene Expression

Let's talk about that because Right now, I mean, there's tons of companies out there, massive companies. You know, you've got companies that are on huge platforms that were never even in medicine that're offering all of these tests.

So, when you look at all these different types of epigenetic tests, these genetic tests and all this stuff that's out Everybody can't have the best test.

You know what I'm saying? So I want to talk about, I wanna understand what epigenetics are and what is a good quality test? Yeah, absolutely. So, so I'll start with genetics if that's okay, just as a baseline because I think that most people know that When we sequence your genome, we're looking at four base pairs, A, C, T's and G's, and we are sort of saying, what do you have?

And we interpreting that data based off of big population level data sets, right? So we might find certain variants lead to Alzheimer's or certain variance lead methylation problems.

And so that industry has been around for a long time. Unfortunately, though, there's not been a lot of growth in that industry. For instance, look at your 23andMe.

They were worth several billion a couple years ago. Now, they're at risk of being delisted from the stock exchange because they've diminished so much.

What you've seen now is that genetic companies are all doing pretty much the same assays, but it's how they are reporting and interpreting the data that really goes to the clients and determines success.

you have people doing, for instance, DNA methylation testing. That's a little bit different than the DNA methalation that we do. So DNA testing for things like MTHFR variants or COMT, that's looking at your biochemical ability to methylate, whereas we're looking and tags on the DNA, which change whether your genes are turned on and turned off.

So the example I always like to get is, again, every cell in your body has the same DNA. Your brain, your skin, and your heart. If we took a DNA sample from any of those, we get the exact same data.

Epigenetics, though, is the reason that all those cells behave differently. As we go from our pluripotent stem cell to the cell type that we're becoming, it's all about what's turned-on and turn-off.

And that's really what epigenetic is doing is it's handling the identity and expression of your cells. And so that's a much more valuable data set because it changes.

It can tell us about risk just as well, even better, but it also is modifiable. So let's highlight expression-of-the-cells because when you don't have the appropriate expression, correct me if I'm wrong, you being the professional here, that where disease can develop, right?

Exactly. I like to use the example of You know, there's a type of gene called the tumor suppressor gene, right? These tumor-suppressor genes do exactly what they say, they make sure tumors don't grow.

On the other side, we have oncogenes, genes that promote growth and might turn into cancer. If you get those dysregulated, then it's going to affect your ability to get cancer, but epigenetics happens in every gene in our body.

So the oncogenes are mainly growth factor related genes. And so generally we want them turned off so we're not leading to those areas and the way that we turn off genes is DNA methylation.

We attach a little group to those genes and then we stop them from becoming RNA, essentially. And so epigenetics just stands for epi means above, above the genome.

These are things that are happening to change. It's sort of like if DNA is a hardware, epagenetics is the software. Alright, so the true question here is what causes gene expression change?

Yeah, your body has a extremely complicated mechanisms to regulate this. And I tell people if you have problems with regulating this DNA expression, you just don't survive.

It's not like a COMT variant or MTHFR where you have increased homocysteine or have heart issues or psychiatric issues where you can supplement with a single supplement and fix those, this is a process that is so fundamental to our bodies and to identity that if something goes wrong, it's usually really, really bad.

So with that being said, we have a lot of different epigenetic mechanisms, but the one that's by far the most studied is DNA methylation, sort of that off switch to genes.

Now what about like environmental toxins? What kind of effect does that have on gene expression? Yeah, massive effects. And this is actually one of the coolest parts of epigenetics.

True Diagnostic has built the largest DNA methylation data set in the world, but we also are really just known for the algorithms to interpret that data.

So biological aging is certainly one those big categories. That we think is important due to how big aging is in terms of health but but we can create algorithms for for just about anything from this data so we Can you know diagnose schizophrenia previously you had to go to a psychologist who could diagnose the schizophrenia psychiatrist and And how many people were probably getting misdiagnosed?

Predicting Disease and Death with DNA Methylation

Yeah, it's a lot. And even now, you could diagnose diabetes, but now we even have subtypes of diabetes. Four different sub types, each with different risks, and each for different treatment recommendations, all through epigenetics.

We can tell what zip code you've lived in due to most of the pollution markers in your DNA. Wow. Again, when you're going to die with a 92% accuracy within a five-year time period, the things we can do with this data are incredible.

and one of the biggest areas of investigation is what we call the exposome. All the different things we're exposed to. Actually, there's just a study last week that showed that the exposome is 10 times more predictive of disease outcomes than your genetics.

That's crazy. Yeah. So hold on one second. You say that you could predict five years in advance before someone's going to die. Yes. It kind of sounds like the Gary Brecken guy where he's like, Oh, I worked for a shares company and I could tell you to the second that Well, there's a difference and mainly which is that we have validated and published our data, right?

We're not making claims. We published with Harvard our ability to predict it with a 92% accuracy in five years. And that's still a big gap, we're telling them, hey, were accurate within a five year time period, no one can get as accurate as even a year or months that it just doesn't exist right now in the scientific world.

But yeah, that's where we're getting to is that we can predict it highly accurately, but not just death, also disease, we could predict when diseases are coming.

We can, again, tell you so many interesting things just from a drop of blood. I know it sounds a little bit like Theranos, right? Just a drip of what?

Yeah, we just need the DNA from the white blood cells that exist in your blood. And so we measure about a little over a million locations, and we get numbers between zero and one.

The closer the number is to zero, that means the more turned on that gene is, the closer it is one, more it turned off that genus. That's a lot of data, right?

It's data we could not interpret by ourselves, which is why AI is so important and why this technology is growing so much right now. So you guys are actively using a lotta AI.

Every day. Unbelievable. Yeah, massive. I mean, we spend a, you know, a lots of money with Compute and Amazon Web Services because we're We're compiling as much data as possible.

And that's how we create our algorithm. So, for instance, we want to, you know, predict death. The first thing we have to do is have samples from people who have already passed away, right?

So we'll go to big biobanks. Our biggest collaborators, Harvard and Mass General Brigham's. where we collect these samples from 20 or 30 years ago and then we know what happens to these individuals and we create algorithms to predict that outcome.

And that's why with aging, we don't have, for instance, if we can't treat aging by waiting 40 years to see what happened, right? You know, I might try some NAD, you might do it frequently, but in order to know if it's extending our lifespan, gonna have to wait a while, and so these surrogates, this testing that we're doing, being able to protect things like time until death, that if see that change, Also, our time of death is gonna change.

We don't have to wait 40 years for these interventional trials to tell us if something's actually gonna work. You can do it at a much quicker pace. And that's really what we started out doing.

Then we found all these other signals which are equally applicable in health. Right, like, dude, how many books do you read? a day. Where do you get this information?

Because this is not just information that's readily available. Yeah. I have all my time spent with primary research. So for anyone who's out there, my trick now is just Google alerts, keywords that I always like to read up on.

Keywords for every peptide you can imagine, key words for type of diagnostic uh and then uh you know again using ai to sort of consolidate and summarize we need to research your dna man that's what i want so all right all very interesting things so alright so going back to to all the epigenetic testing and whatnot what are you seeing through the different like ethnic groups that are out there because you you don't a lot of the biohacking industry When it comes to functional medicine, which by the way, a lot of the stuff you're doing, I consider that precision medicine because you guys are going very precise.

But it's always been available for really like the rich and famous, right? And one of things when we're talking about bringing this to the masses, there's different ethnicity groups that need to be studied as well too.

Is that something that you are dabbling into? Yeah, we're trying. But it's also a problem with even us. Even Mass General's biobank, over 85% of the samples are still Caucasian.

So it is an issue not just in our world, but I think even in the traditional medicine world as well. With that being said, the epigenetics certainly changes with ethnicity.

One of my favorite things to talk about is with some of early research, there's something called the Latino paradox, which means that they have higher rates of disease but lower biological ages than expected.

So that's certainly interesting. And so we're trying to build those data sets all over the world. One of the ways we are doing that is by setting up laboratory testing locations in a variety of different countries so that we can get more representation of a lot of diverse groups and data set.

So I'm definitely doing a lots now in Southeast Asia. I have a a of European representation. Soon we're going to be doing a lot of South American testing within Brazil.

So starting to build those data sets. But the thing with epigenetics is it's still a very new measurement. And so we have the opportunity to correct some of the injustices that were done in the DNA world, where that was the only group that they sort of looked at.

Right. I think that what we are seeing is certainly that it has a whole lot more representation than previously. Still there's some things we need to fix.

What are you guys doing in the black and brown communities? Yeah, so generally So we've been working with cohorts like all of us cohort which are based for ethnic representation And so we're specifically funding trials to get data from those groups particularly those group's with outcome data as well and And I'd say a lot of it is also epidemiologic to look at things like exposures, right?

Ethnicity, Exposome, and Data Diversity

Even just, you know, if we were to plot biological age acceleration by socioeconomics or neighborhood behaviors, we can see things, like, micronutrient deficiencies or these other things.

Even pollution exposure a little bit higher. And so I think that that's the other great thing about these tools is that they can sort of highlight how all these socioeconomic disadvantages in different groups, even myself being from Eastern Kentucky, right?

Not the most advantaged group, but we see epigenetic age acceleration in those individuals as well. So this is a good way to sort of take a really broad diagnostic and be able to talk about those things with real data.

Yeah, I love that. I loved that so, you know, when you're looking at the different groups, are you guys involved with like the blue zones at all? So we are only involved one, which is Loma Linda, and have some data there.

But yeah, it's a big area of research in our field. Okay. Yeah, because, you know, that's one of the big things that go everyone's living past 100, and people really want to study that.

Exactly. And, we have cohorts that are made of only people above 100 years of age, these centenarian cohort to try and find out what's changing. And the good news is we find a lot of what we expect, which is lower inflammation, lower levels of senescence, all these other things that we look at.

But also, as I mentioned, these exposome factors, the things we're exposed to, including diet, nutrition, chemicals, et cetera, those play a massive impact.

And so geographical locations like that are also super helpful to see what they actually are. So when you do the epigenetic testing, one of the things that you guys are also looking at when your doing this testing with that one little drop is micronutrients deficiencies, right?

And then other things besides micronutsrient deficancies, what other type of testing are you doing through that? So if you don't mind, I might even just provide a little bit of history and background on how we stumbled upon this, because it wasn't expected at all.

You know, one of the things we saw is there have been now several biological clocks created. Starting in 2013 with Steve Horvath at UCLA, that really started it.

And since then, there's been a lot of iterations. But every single iteration we found, we've found that one thing was true. The more data you train with, the better your algorithms are.

Right. So we decided to create the most robust dataset we could. We measured everything we can possibly measure in a single individual from full genome to epigenetics to transcriptomics to proteins over 8,000 proteins, over 3, 000 metabolites, like your hormones, dopamine, serotonin.

And we did that in about 5, 00 individuals. So we do that. In every single individual, it would have cost 10 to $15, It's just not a viable option, right?

We're getting into where it's only available for the rich and famous. And so we asked the question, can we just, by chance, predict these other measurements just through DNA methylation?

And we were really, really surprised that the answer was absolutely. So we created predictors of 1,700 different factors. You know, HDL and LDL particle lipids to your hormone levels to environmental chemicals, like PFAS chemicals or lead exposure or glyphosate pesticide exposure, your NAD biomarkers.

And we can do them really, really accurately. We found the study we published with Harvard just in December of last year, we showed that we were 90% accurate within the clinical range.

But most of the time, we were more predictive of outcomes than the classical disease biomarker. So for instance, our prediction of blood pressure was better than measured blood-pressure in this cohort predicting cardiovascular disease, just to give you one example.

they're most of the ones that we created are actually more predictive of outcomes. And the reason for that is because our measurements are a little bit more like HbA1c, sort of a running average over time versus a fasting glucose, right?

So fasting, glucose you could just have a sugary, you know, drink right before you test. It goes up and you can say, hey, that person has diabetes. If you didn't know they already took a drink, whereas HB1C is sort a of running-average, it tells you about that overall behavior.

And that's the same with the DNA methylation is we're getting overall signals, which are incredibly predictive, but the amount of information we get now is pretty incredible.

That's amazing, man. So, you know, obviously I'm very knees deep in the IV vitamin therapy space. How can an epigenetic test really help these medical providers that are offering IV nutrients?

Is it is it able to kind of like give us the information of, hey, this is the type of IV drip the patient needs? Yeah, absolutely. We can show you what their levels are of all of their amino acids.

Um, all their vitamins like the, you know, B vitamins, the ADEKs, we can do your omega threes. Glutathione too. Absolutely. And we do glutathion sulfate.

we could do the metabolites of glutothione. um, We could, uh, acetyl carnitine. You know just about everything that you would put in an IV drip, whether it's a Meyers cocktail or something a little bit more personalized.

And so all of that we can tell. And again, we get that running average. So the idea is that for that average, you probably want to do more than one IV, right?

You probably wanna do a therapy to get those levels back to where we want. We can also then tell you how those are associated with outcomes because we have outcomes on all those patients as well.

One of my favorite examples is you know, ergothionein, it's a supplement that's found in mushrooms. But it helps with mitochondrial function. And we have identified it as being one of the most important things for longevity in all the measurements we take.

So now we can quantify ergothyione and tell you where you're at. Along with all of those other, we now have a report that does over 135 different biomarkers, including NAD.

I'll throw another anecdote out there just because I know a lot of people are interested in NADA. We did an analysis in our cohort, about 15,000 people who had taken nicotinamide riboside, one of the precursors to NAD that's

available as a supplement, versus also the nicotine mononucleotide which is sort of a competitor supplement.

And we found that with NMN, we hardly saw any intracellular increase.

Nutrient Testing and Personalized IV Therapy

But with NR, all of NNAD pathway molecules were increased. Just in a big meta-analysis, were able to say, hey, for longevity we might recommend nicotenamides riboseide over NMM.

Really? Yeah. Wow. And that was published in that same. Would it make sense to take both of the products? I think that if you want to maybe hedge your bets a little bit, I thinks so.

One of things with even NAD is it can go too high, right? And some of downstream metabolites of NADA like 2PY and 4Py have been shown to be toxic to the heart and kidneys.

So generally we don't want over supplement either, which is exactly why testing is important. Look, I take both. I think NMN and also NR. Actually, take all three, NAD also.

So hopefully I'm not overdoing it. Yeah, i feel fantastic. i'm energetic. Okay, so cool. We got the testing that can really be precise to what the patient needs, especially if it comes to IV therapy.

Now, part of that testing, also, there's some of the toxic stuff that come up. And you were mentioning to me that you guys are working with first responders, right?

Which obviously, you know, with my background, this is something that we gotta talk about because, dude, since I retired from the fire department, a lot of guys and girls that I worked with Man, some of them are getting diagnosed, a lot of are being diagnosed with cancer.

There's deaths all the time. I'm in a Facebook group and I see it all time, and it's just like, what the heck is going on out there? Because you know, these firefighters, they get exposed to all kinds of crap, plus sleep deprivation, the stress levels, their cortisol's completely off.

So what have you guys seen with first responders with what you're doing? Yeah, so we're still building these data sets. We're working and collaborating with the University of Michigan on some of these.

But certainly the number one thing we see increased biological age, right? Just as an overall category. And that could be to all the things you mentioned, it could a high stress job, the stress could cause an issue.

It could the shift behavior work, which we can see. Even ER physicians for us are a group with accelerated aging that might be for some the same reasons.

But the big thing we're looking at is much like in recent years, the military and burn pits have gotten a lot of press about sort of predisposing a military service people to things like cancer, as you mentioned, but it's actually the same with firefighters.

Whenever everything is going up in flames, everything that they're inhaling, all the things they are exposed to. All the carcinogens and all that crap.

Right, so we're starting to then see that molecularly, right, to show how they're increasing their aging, but also to actually quantify those exposures.

And so, we are seeing a lot of sort of toxic chemical buildup, even in just the epigenetics, that certainly need to be addressed, and it starts to address it, you really need good data and that's what we were trying to build.

But it's definitive, negative outcomes, unfortunately, based on the risk that they're putting themselves at. Of course.

So when you actually get those results, and you see that there's a lot of these forever chemicals and everything else, what's the typical course of treatment at that point?

It's tough one. Right now, all the rage is the plasma exchange of plasmapheresis. And so this is certainly something, we did a trial with the Buck Institute on therapeutic plasma exchange, and we saw anti-aging reductions with it, with several courses of therapy, but it also removes things like microplastics, it removes those PFAS chemicals, so it's a good way to sort of clean that plasma.

But it is also expensive and it needs to be done fairly frequently. And in aging, it's also a big investigation because some people like to do young plasma, plasma from younger individuals.

Brian Johnson made a lot of news for taking his son's blood and giving his blood to his father. But we see that young plasm definitely has an anti-aging effect, but the therapeutic way to reduce those chemicals is therapeutic plasma exchange, at least for now, probably one of the most exciting therapies.

Interesting. What do you think about that Brian Johnson guy? You know, I've known Brian now for a while. We do some things with him. we created the Rejuvenation Olympics, sort of a competitive leaderboard for the best agers.

And he's doing phenomenal on that. I think that, you know he is certainly avant-garde. So he speaks to my heart, right? I tend to be very close there too.

But I also think what he doing for aging industry is really important, sort of shifting the conceptions on that, talking about it as a true science and as protocol to follow.

And so I know he definitely has his opponents as well as his supporters. But in a recent study, I think over 65% of the physicians in aging tend to support him and the energy he's bringing to the space.

You know, even most recently, he was on with the Kardashians doing our testing with, you know Dr. Huberman as well. And so he brought a much needed new audience to this.

That's amazing. So you guys were part of that with The Kardashian. Yeah, absolutely. So we were just on a few weeks ago with Brian doing our testing with the group.

But the Kardashians themselves in the season finale last year did our test. And quite frankly, did really, really well. Amazing. Yeah. You know, they were phenomenal.

Chloe, in particular, had one of the best aging rates, which would qualify her to be on the top 10 of that rejuvenation. Really? Yeah You know, it's amazing to utilize people at that caliber to really get the message out there because this is how we're really going to hit the masses, right?

It's utilizing some of these celebrity individuals to go through the process themselves and showcase what we are doing. Yeah, exactly. It's one of the funniest things to see on the back end of this is that celebrities do pretty well on our testing, right?

And it's funny and interesting to we all look at them and say, hey, they're getting a ton of work done. They're doing all these things. But they are actually also doing the things that take care of their body because they have the time, the resources.

And so we can see it molecularly.

First Responders, Toxic Exposure, and Plasma Exchange

So it is interesting that they bring attention to the space but they also sort of establishing what are the best protocols and really giving us good data as well.

I've actually noticed a lot of these celebrities, their homes now, they're actually reconstructing them and making them into this biohacking homes where they have the infrared saunas, the cryotherapy, vitamin rain showers, all kinds of stuff.

I think I saw Paris Hilton the other day, her whole thing. It got messed up with the whole fires in California, but she had everything and hers was like customized It'll kind of look like a Barbie's house So but it's cool that they're doing it, you know And you're even seeing a lot of people in the hip-hop world that are dabbling into more of the health of wellness You know, Noriega is one of them.

He actually comes it over to liquid Vita he posted about it the other day and these are things that you know, it wasn't really part of the culture. And now people are just like, they're doing it because they feel a lot better.

The mental focus, clarity, their able to perform better when they are out running or playing with their kids. So it's amazing to actually see that. Yeah, longevity is having its moment right now and really health and longevity are having their moments, but especially longevity.

I mean, you have even people like the Saudi Arabian government doing one billion in longevity research every single year. You know, the longevity specific movement is no longer, you know science fiction, right?

It is it is real and some of the developments that are happening, uh, blow my mind every single day. I think that, whenever I even first started true diagnostic as a company, I thought, Hey, there's no way we're going to, They have longevity escape velocity and start to live longer than 120 like I, you know, I was extremely skeptical.

And now I see that there's pathways to that, um, that are, are based in fact and reality and the science is just exploding. So I hope that. You know as a scientist, it gets me excited, but I that it get's everyone else excited too, because we're about to have massive improvements to our quality of life.

and extending that quality of life for a good amount of time. Amazing, amazing. Right, do you publish any, have you published any books? No books, a lot of scientific articles.

So we've done, I think, over 45 scientific article in the past three years that we published. That's why I usually point to my work, but eventually a book might be in there just to talk about all the things we have seen throughout the space.

Yeah, that would be cool. Listen, I'd buy it. So, you know, one of the things with a lot of new treatment modalities and the testing and everything else that you see in the industry, sometimes when we talk about the functional medicine space, it becomes difficult for us to allow it to go mainstream.

And that's just because we hit a lotta roadblocks with these regulatory bodies. What have you experienced with a lot of these regulatory bodies, you know, really trying to get this more into like that allopathic traditional medicine world where we can really hit the masses?

Yeah, I've got a lot of thoughts on regulatory. But for us, it's always started with aging specifically. And unfortunately, the US does not accept aging as a disease.

The World Health Organization has an ICD extension code which can classify disease as the result of aging, which is really good progress. but the United States doesn't really have a pathway.

If we're going to talk about aging the closest we can get are things like frailty and the loss of muscle mass as we age. I really hope that we see movement there.

And I think there's some government agencies like ARPA that are funding massive projects to get FDA approved aging diagnostics, which is great. But I that the connection between some of these more Um, you know, less alopathic less traditional medicine, um, has to come through data.

I don't think you're, uh, we can talk about patient success stories every single day, but in the back of most of the regulatory minds, I think it's, well, they might be the exception to the rule, right?

Or. And I think once we start demonstrating the data, the reliability, just talking about things like significant outcomes, all of these different things, I thinks it's necessary.

And hopefully, diagnostic testing is a way to do that, to compile it at scale. You think of, again, these physicians, they're all doing 500, 1,000 patients, and really that data goes nowhere.

They see that and that's the end of it. What we're trying to is to make sort of a community where we share outcome data and use our testing Show that we're changing outcomes and we don't have to wait 30 years to do it.

Yeah, man You hit the deal on the head on that one. It's like it At the end of the day you can have all the case studies that that you want showing, you know Oh this patient feels better.

But once you have that quantifiable data, I mean now people have To listen exactly right inscrutable. Yes So, you know, right now we're going through this huge movement with the new administration.

Make America healthy again, the MAHA movement. But we have R. F. K. Jr. leading the health human services for the United States. What's your input on that?

What is your thought about it? Well, I have mixed feelings.

Regulation, MAHA, and the Future of Diagnostics

You know I, we've talked about peptides, it was crazy to see on election night RFK tweet out that, Peptides are going to be something he's focused on to make available again, especially with all the the trauma that we went through I was super excited to see that and you know some of the talks about the environmental exposures and and just you Know the movement back to more natural.

He's like speaking our language. Yeah, exactly and truthfully I didn't see it coming this early like like this is part of The change of course of medicine if it really does happen Completely agree, but I will also mention on the other side.

We do so much with universities. So, you know, we do I mean, We've probably had 47 different university partnerships in the last few years. And unfortunately, that space is a little bit more worrisome.

Things like cutting the indirect rates to 15%, there are now whole universities which are not accepting any more PhDs. They're not doing any investment into research and funding.

And so I see both sides of it where I think, I love the exploration of these other topics, but at the same time, the US has been built on an amazing foundation of scientific research And I don't want to lose our competitive advantage there by trying to cut pennies on lab costs and other things of that nature.

So I really hope that they continue to fund scientific development through the NIH. But I'm also so happy to hear that, you know, they're paying attention to the things we're already talking about.

Yeah, I think it's more or less being able to support the correct type of research, right? Being able fund that type research which like stuff that you're doing, you know, it think is a big part.

Are you connected with the RFK and them whatsoever at all? Not traditionally, we haven't done a ton of government funding, but with that being said, were doing a lot more now.

And so starting moving more in that direction. But yeah, and to even go back, We can't even put the word diversity in grants anymore. they're automatically killed.

So yeah, as we're talking about representation of brown and black communities, it's one of those things that's now even harder to fund. There's good things and bad things, but I think that ultimately the science community is hitting its moment, and I that that is really exciting.

Yeah. Well, what's the next big thing for Ryan Smith over here? You know, the biggest thing, for us, is FDA approval right now. So we've built a huge database.

We've created some great algorithms and great publications, things I never would have thought. But we really want our type of testing to be done twice a year and financed by Medicaid and Medicare.

We think that it can replace a lot of traditional diagnostics with a lots more information at a much lower cost and something that people can make accessible at home.

You see groups like Function Health that are now making at-home testing available and receiving lots of market response. That's Dr. Mark Hyman's company, right?

Yeah, exactly. And so we want to do something similar. We want make testing widely available, but not just do 130 biomarkers but to disease-specific risk scores, Alzheimer's risk score, all the micronutrient testing, and all in one single consolidated diagnostic.

We're going to continue to publish continue, continue validate. And on the other side of things, we really want to figure out what works for aging. Um, and so we just recently published a trial with Yale where we compared 51 different aging interventions, uh, before and after everything from rapamycin to exercise, to hyperbaric, stem cells, all in one publication.

So we're hoping we can really treat aging like the science it is and give people really precise recommendations on reverse. Amazing, man. I love that.

Ryan, if there's one physician or medical provider out there that's listening or even a consumer that resonates with everything you talked about today, what is one thing you can leave them with?

I would say, you know, You can't treat what you can measure. So my number one thing would be do diagnostics. Even if it's not ours, do your blood testing.

Do all of these different things. Get a good baseline and treat it like a project. Treat it, get the data, find out what works to improve that data and then retest.

And I think that that would my be number recommendation to get it more into a science. Obviously feel good, but also keep track of those biomarkers. And Ryan, you know, I'm in the process of writing a new book.

It's called Your Wellness Data. And I want you to have a chapter in that book and talking about epigenetics and everything that you're doing. Yeah, it's so important to be empowered with your own data.

One of my favorite anecdotes is that even before we could start in Kentucky, You weren't allowed to order your on labs in state of Kentucky. You were not allowed order on testing.

and it really limits the amount of empowerment you could have into your own health. And so we got that law changed, thank goodness, but I'm a huge proponent of getting your data, knowing what it means, and empowering yourself in that direction.

I agree. Ryan, where can people find you, man? Yeah, so I tend to have my head buried in science and research rather than being a public figure, Places, you know, have a also, a Twitter handle.

It's just Ryan Smith EpiAge as well, where I'll post some good science. And then obviously you can find me on LinkedIn too, I have more presence on all the scientific work we do.

Amazing. Ryan, it was a pleasure to have you on the podcast, man. Let's get this information out to the whole world. Yeah, appreciate you for having me.

Thanks so much. Awesome, brother. Thank you for watching another episode of a Healthy Point of View podcast. Make sure you follow Ryan Smith, make sure follow True Diagnostics, Make Sure you click share, do all that fun stuff, and make you subscribe as well too.

And we'll see you next week.