Rewind Your Biological Age: Testing And Techniques To Turn Back Time Transcript

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Introduction to True Diagnostic

All right. Welcome to today's session and episode. I am thrilled to introduce our guest, Ryan Smith, who's the founder of True Diagnostic. It's a cutting edge health data and diagnostics company that's really changing the game and epigenetics and longevity.

True diagnostic is a certified lab specializing in extracting deep insights from epigenetic methylation data. A tongue twister, I know, but since launching in 2020, Tru diagnostic has made remarkable strides building the world's largest private epigenetic database, with over 25,000 patients tested on their advanced Epic array.

From this wealth of data, they've developed algorithms capable of predicting inflammatory markers, disease diagnosis, telomere length, immune cell subsets, cellular replication, your biological age, and the pace of aging.

Why Biological Aging Matters

So in my opinion, what sets true to diagnostic apart isn't just their innovation process, but it's really their commitment to leading the field through research.

They have over 50 clinical trials under their belt. We'll talk a little bit about some of them today. They're constantly exploring the best interventions for reversing these markers through, you know, lifestyle interventions, nutrition, medications, supplements, etc.

they collaborate with some of the brightest minds at different universities like Duke, Harvard, Yale, Ohio State and other top institutions to really push the boundaries of what's possible for this methylation data.

They're also the only company offering second and third generation aging algorithms, which is a major leap forward from the traditional first generation aging clocks.

And it allows us to provide allows them to provide more precise and predictive measures of biological aging. So today, we'll be delving into the fascinating world of epigenetics and aging with Ryan.

We'll learn more about how true diagnostic is really shaping the future of health optimization, and what that data can tell us, what reversing and what we can tell us about reversing the biological clock.

And then really, you know, what potential interventions you could be utilizing to reverse your own biological age. So Ryan, welcome to the show. It's great to have you here.

I appreciate you taking the time today. Yeah. Thanks so much for having me. Excited to be here and share a little bit more about, this this idea of biological age and how we measure it.

Appreciate it. So just a quick little introduction from from your self here. I mean, what really got you interested in biological aging?

From First-Generation to Second-Generation Clocks

You know, epigenetics, methylation data. Yeah. So prior to this, I was at a company that was doing a lot of really innovative treatments. We were sort of bringing to market a lot of really interesting things, generally in the area of peptides.

I know that probably a lot of the people watching or are familiar with the idea of peptides. We brought a lot of those to market with my previous company, and one of the, you know, the peptides were exciting.

I think we were seeing amazing patient results, amazing patient benefits. But one question was always in our mind, which is one of the long term outcomes can we're seeing great immediate effects, but how do we also know what's going to be happening in the long term?

And and for that I was looking at ways to, you know, look and measure change in the immediate, sense of the word. Right. So we have these biomarkers that we can look at to change.

For instance, if we're doing hormone replacement therapy, we can see hormones change or if we're doing, you know, things to reduce blood sugar, we can take our blood hormone levels.

But what is a maybe an integrative model that can talk about all of the things that happen with, as we we generally age and get older. And it kept leading back to one thing, which is that aging is by far the biggest risk factor for every chronic disease and death.

And it really introduced me to this area of these epigenetic methylation clocks because, you know, I've always been very interested in longevity, but I also realized that, you know, the typical way that we, we work in longevity now is to do co randomized controls and wait till outcomes to develop and see if there's a difference between treatment groups.

We don't really have the time for that. Otherwise longevity interventions and investigations are really for our children and our grandchildren and not for ourselves.

So we need a really good surrogate tool. And, and that brought me to this idea of DNA methylation. And when we first started poking around in it, we were thinking about it just for biological aging.

And I think that it's still probably the most amazing tool to quantify the biggest risk factor in your health, but it can do so much more now, too. Yeah, that's very interesting.

And so when you talk about the biological clocks in the, you know, in my interest, we talked about the second and third generation. Can you tell me a little bit about the history of the, of the clocks and where we are currently versus where we were in the past?

Yeah, we've made such rapid strides, over the course of the last decade. But, really, I would say the conversation on these clocks starts in 2013. It started with, Steve Horvath from UCLA.

And at first he developed it, an epigenetic clock that was trained to predict the age, the chronological age from a biological sample. And this clock was really got it got a ton of notoriety and hope because for the first time ever, we could get really, really accurate at ages.

Accuracy, Precision, and Third-Generation Advances

From, any DNA from the body, any DNA that we could collect by reading the gene expression, what's turned on or turned off. And because aging is, again, so ubiquitous in, among all of us, there was a pattern molecularly that we could see there for the first time.

And so that was really exciting. And at first it was used at things like crime scene investigations, or it even was used to date refugees from the Syrian refugee crisis to see if they were adults or minors and therefore eligible for asylum.

In some countries. And so it had some really practical applications, but it really wasn't applied to health. And so they started using this data in really big cohorts and cohorts like the frames in heart study.

And what they saw was that those people who had younger ages with this test than their chronological age. So someone taking it might be 35, they were reading 32, they were protected from negative outcomes, and vice versa.

Those people who were older with this test in their chronological age were more at risk for negative outcomes, such as disease or death. As we follow them across that cohort, longitudinal lifespan.

So what this was sort of doing is, even though it was meant to be a bio, chronological age predictor, it was actually telling us about biological function and biological function that there was in related to all of the outcomes that, we experience on a day to day basis.

So we're really the first time capturing a really biological signal of this aging process. And that was super exciting. But, but since then, we've made a lot of improvements on that.

You know, the main improvement is that, you know, we don't really care about your chronological age, right? You know, we all know people in their 50s who look 30 and people in their 30s who look 50.

We really care about the biological process, which is driving that. And so, after that, the first generation clocks of those clocks trying to predict chronological age, but the second generation clocks are those clocks which are, trained to biological features of aging.

So taking in the biology, the performance of our bodies and using, sort of clocks to train it against some of those biomarkers, and those were a huge step forward because they were way more predictive of disease, and way more predictive of death rate predictive, more predictive of outcomes, which is really at the end of the day, why we're trying to use a test is to see where we're at, where we're going to be, and then hopefully make changes to change our trajectory.

If it's not something we like to see. Yeah, sure. So, you know, when I first saw biological age clocks come out around that time, you know, 2030 or excuse me, the the original clocks, and then it started to come to market.

I thought, all right, this is just another one of these, like, I don't know, pointless tests that we're going to waste money on to try to figure out, okay, what's our biological age?

How valid are these? How accurate are these tests? And so it seems to me, from the second to third generation, now, we've had, you know, with even with true diagnostic alone, over 25,000 different people studies.

So you're able to refine the data. I mean, is there a big difference between the second and third generation clocks that now is making this data applicable?

And, and really, you know, is a great resource for us, not only personally but as a practitioner to help people implement things that are going to help reverse it.

Yeah, they're 100%. And it's hard to even in a single conversation, talk about all the things that have changed on good example. You know, if we that original Horvath clock, if we, if we look at one standard deviation of age acceleration, so you compare someone who's maybe the same age biologically as chronologically, and then you have someone who's older biologically with one standard deviation in their chronological age.

In the Framingham Heart Study, that represented a 2% increased risk of death, which is not the biggest effect size, right? Versus the third generation clock in the dizzying pace represents a 64% increase risk of death, which is a massive, difference.

And so they're way more predictive, which is is certainly something that we care about.

Organ-Specific Aging and the Symphony Clock

But there are other things about these newer generation clocks that are also important. Mainly they're very precise. So we know that if we take, you know, the same sample and tested multiple times, we're getting the same result.

And it used to be that that wasn't always the case. The original Horvath algorithm could vary up to 30%, for

instance, on the same sample, which means that as a clinician, if you're using that you don't know just technical noise within the test or actual biological signal that you should be worried about.

And so now these plots are precise. They're highly predictive. But even more than that, they're starting to also tell us the why. And that's also incredibly important, right.

You know, that aging is so multifactorial. When we first started in 2020, there were nine hallmarks of aging. Now there's, you know, up to 18, 19 recognized hallmarks of aging.

And and so a lot of things happen as this process occurs. And we really need to know why, right? Someone who's smoking, for instance, might have their aging driven by, you know, their lungs or their cardiovascular system, whereas someone who is, you know, has insulin resistance and maybe a little bit obese might have metabolic aging, and higher inflammation levels.

And so, you know, there are different ways we can all age and, sort of start to deteriorate. But now we can start to tell you ways on exactly why. One of the best examples of that is the Symphony clock we just launched with Yale, which tells you the age of 11 different organ systems.

So it tells you your heart, your brain, your musculoskeletal system. So we can really start to target approaches on an individual level to aging. And I think that's a major breakthrough.

As a huge breakthrough, because, you know, with the biological age, just the one number, we don't know what's creating or causing our aging, but with the symphony Age, now, you're really as you're only as young as your oldest organ system.

Right. And then if we can tailor treatment specific to that system, then, you know, we should be able to see that, that, that age change.