How To Optimize Your Health For A Brighter Tomorrow Transcript

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Introduction to Chris Mirabile

Hi. Welcome back to the Peptide Summit. Today we are going to talk about longevity with Chris Mirabile. I'm so excited to talk to him. He's such an interesting guy.

As a serial entrepreneur, brain tumor survivor and youngest winner of NY News Stern Business Playing competition. Chris is known for beating the odds.

Throughout his career, Chris was pursuing a lifelong passion, health and wellness, with an emphasis on avoiding disease. Spurred by his encounter with a brain tumor, extending his healthy lifespan, and maximizing his performance and well-being.

As a self-proclaimed citizen scientists Chris dug into the scientific research on longevity and experimented with supplements, diet, exercise, and lifestyle hacks to find the secret to living a long, healthy life.

As Chris shares on his blog slowmyage.com and according to independently verified third party epigenetic, metabolomic, telomere and physiological tests, he was able to reduce his biological age by 37%.

His page pace of aging by 31%, and his telomere length is the equivalent of a seven year old's. The outputs were best results for labs ever seen, according to the lab's founder.

Now we're approaching a chronicle age of 40. Chris's biology is, by most accounts, that of someone in his mid-twenties. A particularly noteworthy accomplishment for someone who endured the physiological and psychological stresses of a brain tumor.

And following his lifelong passions. And after more than a decade of research and experimentation, Chris founded NOVOS the first nutraceutical company that targets the 12 biological causes of aging to increase longevity.

NOVOS, this includes a scientific advisory board of six of the world's top biologists and geneticists who study aging from Harvard, MIT, the Salk Institute, and more.

With NOVOS, Chris created more than just a supplement company. He built the first of its kind consumer biotech platform that leverages the latest science to help people take control of their health spans and lifespans.

Welcome, Chris. We're so excited to talk to you today. Thank you. Thank you. That was quite the intro. I feel like the episode is practically over. I know it was, but I think all of it was just so interesting and really explains why you're passionate about your company.

I would love to learn more about your health journey with this brain tumor. Sure. Yeah. So this this affected me at an early age. So I was already interested in health, and I was living a very healthy lifestyle since I was 12 years old.

I picked up an issue of Men's Health magazine and was inspired by it, and started exercising and eating a healthy diet.

Brain Tumor and Longevity Awakening

And so it was that much more of a surprise to me to suddenly be in New York City on a school trip and wake up with blood all over my shirt, because I have had a seizure and they separate my tongue.

and being rushed to the emergency room and being told that you have a brain tumor on your left temporal lobe that was bumping up against the hippocampus and larger than a golf ball, it was that much more surprising because of

how healthy I was already living.

And that experience was transformative in in every way you can imagine. from inspiring me to be an entrepreneur and trying to chart my own course to having a deeper value for, for life and, an appreciation for even things as crazy as pain and frustration.

I built an appreciation for that because I was alive to experience it. So it was an amazing experience that I consider a gift. when I look back on it, it also planted a seed for me, which has blossomed into what is essentially NOVOS today.

But it took decades to get here. that seed was essentially an interest in long term health, which most people don't really consider until maybe they're much older, or maybe not at all in their lives, though your audience is definitely considering it. But, most people, especially teenagers, are only thinking about short term health outcomes.

They're only thinking about, you know, whatever that specific goal is right now. Maybe it's weight loss or muscle building or focusing better, or building libido or whatever it might be, thinking of those goals, but then not thinking of what the repercussions might be of whatever intervention you follow in 10, 20, 50 years from now.

I was thinking about that ever since the brain tumor. So for a long time, and about ten years ago, I came across a scientific paper published in the journal cell.

It's now considered a seminal paper called The Hallmarks of Aging. And this paper I identified through a meta analysis of hundreds of other scientific papers, what's known as the nine mechanisms of aging.

So these are the cellular reasons why we get older to be defined as a mechanism of aging. It has to be something that if you accelerate it, it's going to accelerate aging.

and it's also found as a consequence of aging. So older animals across species, including humans, find that these mechanisms are accelerated or further, degraded as you get older.

and if you decelerate it, you can actually slow down the rate of aging. And so there are nine of these. And when I learned this, it gave me this new lens through which I could look at my own health and my own aging.

And so, so that was the first, the moment, that I had in the area of longevity, because prior to that, I didn't even think of the term longevity. I was just thinking of, you know, trying to be healthy for as long as I could.

The second thing I gathered from this paper was that aging is something that is actually possible to impact. It's not something that this is. I mean, aging itself is inevitable, at least at this point of time.

But the rate at which you age and the risks that can come from the aging process is something that's malleable, that you can actually impact. And we can talk more about that, I'm sure.

In this interview, we will, but those were two revelations that I had from this paper. And then that's when I started my journey. That eventually ended up becoming what is now NOVOS.

What a wonderful story. And I think you brought up a lot of great points that, you know, the teenager that is slamming down these nasty protein drinks that have a bunch of gross ingredients in it, you know, they're not thinking about how is this going to impact my body?

And it happened to me. I was, I had an assistant coach for a sport. I don't want to call this person out to much. And he was drinking just like monster drink like one at, like 8 p.m.

or it was one of those energy drinks and I'm like, hey, like, why are you drinking that right now? And he's like, well, you know, I know it's going to kill me someday, and my heart's going to explode, but I just, I just don't care.

And that's like the anti longevity aspect, right? Like you want to be like, what am I doing? What am I putting in my body. How is it going to affect me the next day.

And you know, as a mother, I try to tell my kids that, but I also don't want to be like too strict that then they, you know, they go to college and they just like, explode.

But then anyway, I think that's a great point because really, this thought of longevity when you were 12, you were already thinking about this. And what a gift.

Like you said, you turned this. Wow, a seizure, you know, which is very scary. You know, as an ear doctor, when we see seizures, it's it's a really scary event that you turn it into something beautiful.

So why is longevity the most important aspect of our health and why are we even talking about it? Yeah. So longevity is incredibly important because first and foremost, it is the number one risk factor for chronic illness.

And those chronic illnesses include cancer, heart disease, Alzheimer's, dementia, Parkinson's, diabetes and then other things like sarcopenia and glaucoma and so on.

So even something like lung cancer, people assume it's cigarette smoke, but it's not. It's actually aging and it's by a significant margin. Don't quote me on this, but it's something like five times more, culpable for the the, lung cancer is aging, compared to cigarette smoke.

So that in and of itself is, I think, reason enough to want to think about longevity and the process of aging. but I think it goes beyond that as well, because when you look at these mechanisms of aging and the things that decline or degrade over time, that leads to this aging process and these chronic illnesses, if you're looking through that lens and looking at optimization of each of these mechanisms, you're going to improve your health today, right?

So this isn't like some, you know, buy this life insurance policy and you won't really see it until like your final days. Right. Like that's you know, that you will see it in your final days.

Of course.

The Hallmarks of Aging

but more importantly, you're going to be receiving the dividends today in, in your, in your current, life and so you brought up this example of your assistant coach.

You know, the first thing that came to mind when he said, like, you know, or you said that he was taking it at 8:00PM and he said that his heart might explode, but he he wants to take it anyway.

My first question was in my head, what what exactly is wrong with his health in the first place, that he feels the need to have stimulants at 8 p.m., he's most likely undernourished, not sleeping well, maybe overly stressed.

All of these things where he feels he needs a pick me up at 8 p.m. and, so that in and of itself is an issue. And if you focus on longevity and you focus on these hallmarks of aging, you're actually going to optimize your biology today and you're going to feel better today.

I'm, I'm doing things approaching 40. I'll be 40 in a few days. that are exceeding what I was doing in my teens and 20s. So I used to run track in high school, and, I set a personal best for a mile, though.

That wasn't my my my, competitive distance. But I set a personal best for a mile when I was in college. I'm very close to exceeding that now. At 40 years old, it'll be at the low five minute, mile pace.

And, I'm doing that because I have optimize my cellular cellular biology according to this perspective of longevity. And you're seven years old for your time.

Yeah. Well, I mean, it's the equivalent of a seven year old. And, you know, when we talk more about, like, the idea of biological age and what it is, I can bring some clarity to that because I don't literally think that I am 25 years old in every sense of the word.

Right. there's some some complexity to that. But, but but important aspects of health are related to that younger, younger figure. Yes, absolutely. And I tell my patients that a lot.

You know, the last decade when I've really dug in, worked on my health, I did an integrative medicine fellowship. I feel better at 42 than I did when I was in my 20s.

You know, I had an autoimmune disease, Hashimoto's. That's reverse. So yeah. And going back to the, you know, my assistant coach. Yeah. Like I a couple of months after he was posting and how he was at the hospital and has some mystery illness and, you know, these things catch up with you if you don't correct your aging and those processes leading to inflammation and aging and all of these things, it's just you're going to have a diagnosis, unfortunately.

And that's why we have to be proactive. And that's why everyone is listening to this peptide summit to learn more about how to to optimize. So why exactly do we age?

You've talked about, you know, aging, from a standpoint of, you know, exercise and, you know, you're feeling better now, I know if you look at people, if they're doing things to increase their age, you know, inappropriately, like smoking, drinking, working night shift, you can see it in their face.

So, you know, what are what are these 12 hallmarks of aging and why exactly do we age? Yeah, that's a great point. when you see someone who smokes a pack a day over, you know, the countless years, and you look at a photograph of them, you can even take twins.

Studies of twins who once smoked in one didn't, you can you can clearly see that somebody accelerated their aging, sped it up. and there are others who you can see slow down there, aging, for example.

We all know the 60 year old who looks like they're 75 or 80. and then we know that 60 year old who looks like and behaves as if they're 40, with all of their youthful energy and so on.

And that's just a case in point example of slowing down the aging process versus accelerating it. And as the researchers have found, anywhere between 80 to 90% of the aging process is based on lifestyle and environment, and only 10 to 20% is based on genetics, which I think is really empowering.

When people hear this, it's that you can actually take it. And, in your hands, the aging process. So specifically, why do we age? There's, as I mentioned, the hallmarks of aging elucidated what those biological, cellular processes were.

since then, those original authors in the ten year anniversary republished that paper with an additional three hallmarks of aging. So now there are 12 known mechanisms of aging.

And, I can go through I don't know how much time we have. I can give, quick explanations for each of them. Or I could just read through what each of those are.

What would you. Maybe read through them and then pick your your favorite? I do want to say, though, what you said about how only 8 to 10% is genetic. I think that that should empower people.

But people like to use genetics as an excuse, though. So, for all of you listening out there, you can't do that. You can change. Yes, definitely. yeah.

Even things like for not all diseases, but many diseases, disease risks, genes are actually activated or deactivated based on lifestyle choices. Right.

So you might have a higher risk of diabetes or heart disease or cancer, but the lifestyle decisions you make are going to minimize or maximize the chances of those outcomes.

So the, the difference, reasons why we age. So I'll, I'll quickly go through these. One is mitochondrial dysfunction cellular senescence which are zombie like cells that accumulate in our body as we age, loss of proteome stasis.

So this is protein upkeep within our body's altered intercellular communication genomic instability. So this is DNA damage. This was once thought of as the primary reason why we age.

And this is where like antioxidants and and oxidative damage and so on really caught on, especially in the 80s and 90s and into the early 2000s. but it's been since shown that this is just one of many causes of aging, and it's not nearly as impactful as once thought, epigenetic alterations.

So we can talk about the epigenome. That's an exciting area that we can cover telomere shortening. So you mentioned my telomeres earlier. So telomeres are the protective end caps of chromosomes that contain our DNA.

And every time there's a cellular division they get shorter. It's correlated with aging. But it's not a strong correlation. It's about a 0.3 correlation.

deregulated nutrient sensing. this is nutrients like, IGF one growth hormone and glucose and so on. And how our body deals with these nutrients, stem cell exhaustion.

So we have fewer stem cells, or they're less capable of creating perfect replicas of themselves as we age. Inflammation. So this is this chronic inflammation that starts off as a whisper, when we're like in our 20s or early 30s, but then it grows in intensity and it becomes lather and lather as, as we age.

and we can see this in different blood biomarkers, like CRP and the Interleukins and so on, disabled autophagy, and then finally dysbiosis, primarily based on, gut microbiome dysbiosis.

So are there any of these that you'd like to dig into or love it. Let's talk about the cellular senescence and then epigenetics. I feel like those are really good ones.

And they're becoming more popular to to discuss. Sure. So first it's important to note that all of these are a complex web. They impact each other. So if you have a favorable effect on one of them, you're most likely going to have a favorable effect on all of the others.

but what's most important, from our perspective at novos is to try to not at through secondary mechanism, but instead through a primary mechanism, address each and every one of these hallmarks.

And that's how you're going to have a significantly greater effect on on the aging process. So specifically cellular senescence is they're oftentimes referred to as zombie cells.

So these are cells that kind of, fall apart, self-destruct, are no longer capable of of performing their role as a cell. And normally through processes like autophagy where the body will recycle, these cells in the cellular components, or apoptosis, where the cell will commit suicide, so to speak.

that's the what would ordinarily happen to cells in these cases, senescent cells, for some reason, they fly under the radar and they, don't end up getting removed through apoptosis in autophagy.

And they continue to exist. And the problem with them is not only that they are present and they're not performing their function, which you can imagine if you have a lot of these presents in tissue and then an organ, then that organ is not going to perform as well.

Cellular Senescence and Epigenetics

But perhaps even more importantly is that they secrete what's known as a susp, a secretary associated senescent phenotype of things like cytokines, inflammatory molecules that will then cause nearby cells to also, become inflamed and then eventually potentially senescent as well.

So we see the process rising exponentially as we get older. It's one of the reasons why our skin wrinkles. It's one of the reasons why our, our arteries harden, and get more stiff.

And so it's it researchers have invested lots of money, and there are a lot of biotech companies focus exclusively on removing cellular, or senescent cells.

And that process is called a central lytic. So a molecule that is able to selectively target senescent cells without harming nearby healthy cells is the analytic.

The issue with scent Olympics is that oftentimes they're actually not that clean. There are unwanted casualties around those senescent cells of healthy cells.

And so you have to be careful with it, especially when companies are claiming to be sent a little mix, where products are claiming to be of the limits.

The other thing I would say is that most companies that are claiming, perhaps all companies that are claiming, at least over the counter to be analytics, are actually not analytics.

and they're probably not even doing research of their own. We've done studies, for example, on our formula and found that rather than the analytics property, never score.

our foundational product has a scent of static property. So it's able to not only prevent senescent cells from propagating or, secreting their inflammatory molecules and causing other senescent cells to become senescent, but also reducing the size of the senescent cells.

I like to say that the senescent footprints and we were able to do so as significantly as the prescription gold standard longevity drug, rapamycin. So more than 50% reduction in the size of the senescent cells.

And I feel like that is a safer way to address cellular senescence, because researchers have also found that if you remove all senescent cells in some animal models, for example mice, it can actually have a negative effect on the health of the mice.

So there's a happy medium between the two. You want to remove senescent cells, but we don't know exactly which ones. So the do no harm approach for us is to actually, prevent them from spreading and actually shrinking the size of them.

The second thing you asked about was, epigenetic alterations. I believe. Okay. So the epigenome is really important when it comes to the subject of longevity.

And it it's it's relevant also when we talk about the idea of biological age. So the epigenome is a layer that sits on top of your genes. So we're all familiar at this point with the idea of DNA and genes.

but most people aren't yet familiar with the idea of the epigenome. So an analogy I like to give is that if your genes are a piano in the actual keys on the piano, your epigenome is the music that's being played on on that piano.

And when you're very young, your epigenome is perhaps playing something beautiful like Chuck Tchaikovsky. Right? And then as you age, certain keys are incorrectly pressed.

Other keys are not pressed when they should be. The rhythm is off a little bit. It's not perfectly timed anymore. And so things start to fall apart until when you're very old, maybe it doesn't even sound like Tchaikovsky anymore.

And so there are patterns to this. And, certain genes turn on when they shouldn't and turn off when they shouldn't. For example, an anti-inflammatory gene might turn off when it shouldn't as you get older and then inflammation starts to, run amok.

And so these patterns have been detected, by scientists and they've been able to build algorithms which are these epigenetic, biological age clock algorithms where we can see at any given point in time, the better algorithm settings, some of the earlier ones that aren't as, as powerful, don't do this, but the newer ones, are able to correlate your epigenome with morbidity risk.

So the chances of a chronic illness, mortality risk, as well as quality of life metrics like things like your gait speed and, your mental reasoning and, memory and so on and so forth.

and so this is where the idea of biological age comes in, at least the, most affective accurate way to measure it. There are many other ways people are measuring biological age, but you always have to be skeptical of what they're using to measure their biological age, because if it is not one of the most scientifically validated tests out there, looking at your genome, it's probably just like, a correlate of aging, something like, you know, I could technically look at my, my mile speed and say that I am biologically, you know, 20 years old because I'm running faster than the average 20 year old.

But that's that's not actually the full story about my biology. Right. Whereas the epigenetic clocks are at least getting closer to that full story. Not perfect, but getting a lot closer because it's measuring the epigenome.

in your blood. Be cautious of salivary or, buccal swab based epigenetic tests, but at least in the blood, it that that is, methylation data from all of your cells across your body.

It's touching all of your organs. And so that's how you can get a good idea of how you're aging overall. So the epigenome is essentially turning genes on and off.

And researchers have found a lot of promise in being able to, kind of coerce the epigenome to reflect a younger state. And, there have been studies where in mice, for example, they're able to, take a specific organ like the liver and make an old liver young again, or even eyes and taking, an animal who has gone blind from age and essentially make them see again.

And this is the hope that we can then have this organ specific approach for humans as well, starting with blindness is most likely what, what, researchers will begin testing, and apply it to different organs.

And then the question becomes, can we actually do this on a full body basis? which we don't yet know if we can if people tell you we can, they're getting ahead of things.

Yes. I love all of that. I think it's it's so great to know that we can go and change some of these hallmarks of aging and, you know, slow down aging.

So, you know, you have a website that is called slow My age.com. So tell us, you you do think we can truly slow down aging. And I think we know that the research shows you can.

Oh 100% without a doubt we can slow down aging. again, we can we can see it in animal studies, we can accelerate aging, with different lifestyles and different molecules.

We can feed animals and we can slow it down, just as well, in humans, there's no reason to believe that's not the case. We see, just anecdotally in real world settings, how people, you know, again, with with poor lifestyle habits like smoking cigarets and drinking too much alcohol and so on, so on, can accelerate their aging.

And then those who are physically fit, eating a nutritious diet, getting all of the micronutrients they need for proper health and functioning are slowing down the process and reducing the risk of disease, and they're more physically and mentally capable as they age.

yeah. And so my a.com, I keep track of the interventions I follow and then all of these different, biometric outputs. So for example, I have 16 different epigenetic, clock outputs.

So as I mentioned, there are many different clock, some better than others. And so I've tested. Yeah, not all, but close to all of the at least the well-known ones out there.

And I've seen, you know, the variation between them. But overall, with a couple of outliers that that have said that I'm much, much younger than I actually, like the Hannam, immune system clock said that, 17 years, 17.6 years younger than I actually am.

That's kind of an extreme outlier. Most of them are averaging about, about 14 years or so younger than than I actually am chronologically. and then I've also measured things like metabolomic clocks, which looked at more than 600 different biomarkers and then calculated my biological age based on those, real world physiological markers like pulse wave velocity and VO2 max, and resting heart rate and so on.

Even a facial age AI tool that we offer for free on the novos website called face H. If you go to Novus labs.com and search for face age, you can find it, which is I trained to determine how young you look and it gives you skin health, markers as well, like wrinkles and inflammation and so on.

And then tips to improve all of these. So across all of these tests, if I average them out, the epigenetic tests metabolomic real world physiological ones, spatial age and so on, it averages out to -14.4 years, which is like square right square in the middle of what these epigenetic tests are also telling me.

So what do I take this to mean? I don't literally think that I am a 26 year old, right?

Measuring Biological Age

I look older, so there's other aging processes that are taking place. When I take this to mean though, is that I have the morbidity risk, the mortality risk, and also the the cellular functioning or capabilities of somebody of an average 25 year old. So, I don't think I'm literally aging in reverse, but I do think that I am maintaining a healthy body that is equivalent to that of someone in their mid 20s, which, as far as I'm concerned, is is all that I can really ask for and is still nonetheless extremely important.

the other thing that's worth mentioning is my pace of aging. So my pace of aging, again, measured by the epigenome, and we offer at novos a test called an novos age test.

We licensed this biological age clock from researchers at Columbia and Duke University's because although we could have built our own black box tech, tech internally to test this, we wanted to go with what the scientific consensus was for the most accurate and precise of the tests out there.

And this is a third generation clock called the do you need in pace clock. And so, we want to offer the best to consumers. So this specific test can tell me the rate at which I'm aging right now.

And if it, aging at a rate of one, that means everyone from the logical year I'm aging one year biologically, if I'm aging, 1.2, which, say, a cigaret smoker might be there aging 20% faster than the average person, I am aging at.69, which is 31% slower.

and so what that essentially means is that going forward, my trajectory at Beijing is actually lower than the average person as well, which is extremely important.

This same study that you need in pace clock study, the researchers looked at the fastest aging, the average aging, and the slowest aging people in their cohort of more than a thousand people that they followed from five years old to into their 50s. Now.

And they've been following up every five years. over that time span, they took photographs of these people, and

then they merged those photographs with a computer.

software where you're able to see individual faces, both male and female of the tens, again, slowest, fastest and average aging people. And they're all 45 years old chronologically.

But when you look at these photographs, you can see dramatic differences. The the slowest aging people look like they're, you know, 6 or 7 years younger, the fastest aging look like they're a decade older.

So when you compare those two to each other, it's like a 15 to 20 year discrepancy in how they look visually. so this is a superficial side of aging, but it is something that's relevant to many people.

And so addressing aging is also going to slow down your physical aging, your superficial signs of aging, everything from your skin, healthier skeletal structure and so on.

your adipose tissue, the fat in your, in your face. So all of that is extremely, relevant when it comes to addressing your aging. Yeah, that's a great point.

And though I will say that some people, you know, they do all the plastic surgery, fillers, Botox, but, you know, I'm always like water. What's their lab work?

What are they? You know, what are they actually doing? And you can see those two by looking at the full body, you know, do they have good muscle tone and all of that that, you know, so I think that it's good to actually get the bloodwork, you know, actually, where are you at. How are you aging. So can you go into specifics.

You're like about biological age testing and what what's your favorite favorite ones out of that? You did say that you wanted to look at the mitochondria, in that methylation, actually the methylation.

But that's an important thing for you. And then like telomeres, that's pretty trendy to to check if you can talk about those. Sure. So as I alluded to earlier, there's different ways that people will measure biological age.

And so you, as I said, have to be skeptical about how they actually measure it to them, come to their conclusion for their biological age. And different tests, have different outputs.

And like I said, even for my own results, like one test set, 17 years younger and another one said, I'm ten years younger. And that's a wide discrepancy.

So you really have to look at the same test and compare apples to apples. First of all, if you want to see, how someone compares to someone else, or if you want to see how you are improving over time.

when it then comes to the categories of biological age testing, you know, people are excited or have been excited in the past about telomere length. our perspective on telomere length is it's a check off the box metric.

So it's something that we offer in the novos age testing kit. It's one of the three outputs we provide. but what's most important about telomere length is to make sure that you're not too low of a percentile for your specific age.

So for example, if you're like at the 10th percentile or the fifth percentile, you should be concerned because short telomere length is correlated with disease, like gastrointestinal cancers, and potentially shorter their lifespan as well.

Whereas, if I have the telomere length of a 7 to 8 year old, it doesn't mean that I'm literally biologically 78 years old. It just means that my my, percentile is on the higher end.

I'm in, like, whatever it might be, I don't recall, but maybe the 95th or 97th percentile for my age. Right. So, telomere length is interesting, but it's again, just to check off the box, make sure your, your, percentile is not too low, and then you can move on from that metric.

if you really want to get accurate. Epigenetic tests are the most advanced and evolved of the testing. There's other promising areas of what's called the multiple.

So you have your genome and your epigenome and so on. So there's the transcriptome as well and the proteome and metabolome. And I won't get into that for the sake of this discussion because they're not as far evolved.

but the epigenome is where researchers have been spending more than ten years now building these algorithms to detect how old people are and their risk of of diseases of aging and so on.

And then within there, there's, first generation test, second generation test, and third generation test, the first generation test. if you if your audience is familiar with this field, they may have heard of the Horvath test created by Professor Steve Horvath.

This test was the original and it was focused on they were tuning it to chronological age, so they were trying to predict how old you were chronologically.

And this might be useful for things like, like rhymes. Right. Trying to determine how old somebody is based on their blood sample. it's not nearly as important when it comes to the practical, you know, health use case that, that we're interested in.

So second generation tests then started to train their clocks on morbidity and mortality data. And that's where clocks like the final age clock or the grim age clock clock came from.

Finally, third generation test. This is the do need in pace clock that I mentioned earlier that novel offers. These are the most advanced tests. These are based on longitudinal data sets.

So they are based on very long periods of in in this case, about 50 years of tracking more than a thousand people and seeing how they are aging over this period.

And who are the people who are getting diseases at early ages? Who are those who aren't? Where are the people that have had tremendously stressful lives?

For example, they found that people who had like childhood trauma and abuse and so on, had accelerated aging compared to those who didn't. So a lot of insights have come out of this and this.

This clock is is amongst it is perhaps the very best in existence right now for predicting, in terms of both accuracy of the test and precision of the test, both which are of utmost importance.

So we recommend that test the nervous age test offers that. And we say that's what 90% of your focus should be on is that output. And then 10% could be on the two remaining tests.

Telomere length as I mentioned. and then we also offer a biological age output as opposed to the pace output. But that is admittedly less accurate and precise than the pace output.

So that's why we don't emphasize it as much. Yeah. Thank you for explaining that. That makes a lot of sense. And there's a lot, like you said, of choices out there.

And it's depending on what you really want to see and, and, and risk stratify, you know, if you are aging at a high rate, maybe you've got to check on the alcohol or get better sleep or get off night shift.

I know that's when I work in the E. R., I work in the night shift, and I can I look in the mirror the next day and I'm like, it's terrible, but it's I.

I only like to work night shift in the ER. It's just a chill vibe, while there's craziness coming in.

NOVOS Products and Free Resources

But anyway, so how can novos, like, how does Novo step in with these 12 hallmarks of aging and explain exactly, exactly what it is? You said that there is a, novos core.

What is that? And what are some other things that novos can do to help? Sure. So, first of all, I founded novos as a public benefit corporation intentionally so that we could do more for consumers, whether or or the general public, I should say, whether or not they purchased our products.

so it's really a mission and vision driven company. Our vision is to add more than a billion years of healthy life to humanity, and our mission is to make longevity as accessible and achievable for as many people as possible, not just the billionaires who are oftentimes cited in the news for trying to extend their lifespans.

So how did we do this? We have three legs to come to the company. The first leg is formulations, the second leg is biological age testing and the third leg is free.

Resources. So that first leg, the formulations we created, we have three products on the market right now Novos Core, Novos Boost and elbows. Vital Novus core is our foundational product.

it's a daily sachet. This is what it looks like. you tear it open, you pour it into your water or smoothie or yogurt. we have an orange flavored version sweetened with stevia, and we have an unflavored version with no sweeteners.

but that doesn't taste good on its own. You need to mix it with something. it contains 12 ingredients. It's the very first formula in the world, to address all of the 12 hallmarks of aging simultaneously.

even on the biotech and pharma side, no one has done something quite like this yet. we filed for patents on this formulation. and multiple other formulations that are similar to this.

and we've done a number of studies on it, both in vitro and in vivo. So in vitro studies we found for example, a reduction in DNA damage from irradiation, a reduction in DNA double strand breaks from chemo therapeutics.

We've shown that we can reduce the size of senescent cells, as I mentioned earlier, by more than 50% on par with the prescription longevity drug rapamycin.

We've shown at the Salk Institute. the study that found that we are able to reduce a process known as oxy ptosis, ptosis, which is, integral to Alzheimer's, Parkinson's, and even certain forms of cancer.

and we also were able to show in that same study that we reduced cellular inflammation. we've done a case study where, participants were tested for their biological pace of aging before and after taking novos and after six months, we were able to, reduce the pace of aging for 73% or approximately three quarters of the participants, by a statistically significant margin, in that margin averaged, more than 8% or almost 9%, which is the equivalent of an entire free month of healthy life per year, if you want to think of it in simple terms.

and then of those who didn't slow down their aging, nobody accelerated in aging. So you would expect that some people, because of stressors in their lives, working the night shift or not eating healthier, drinking too much, and so on would have accelerated.

So the fact that they didn't, gives hope that it's actually our formula that's blunting the effect of those, those stressors. so that's our foundational product.

We have Novos Boost, which is much simpler. It's one single powerful longevity ingredient that your audience may have heard of called men or nicotinamide man or nucleotide.

Dr. David Sinclair at Harvard has really popularized this ingredient with, with his research. and then finally, Novos Vital is our newest product. It's a daily chew.

You have four of them per day, ideally with a meal. This is focused on organ health. So whereas novos cores focus on the microscopic hallmarks of aging, Novos Vital is focused on organs that decline with age, specifically the brain, eyes, the gut, liver, kidneys, muscle.

And, I'm forgetting one and heart, the cardiovascular system and, seven ingredients. It's got 11 times more active ingredients than typical gummies do.

so we packed tons of active ingredients into this formula. and those are our three products. The, for the second leg of, of the company. It's the biological age testing.

I've already talked about Noble's age three tests, the pace of aging, biological age and telomere length. And then finally, the third leg of the company, which we haven't talked much about, is where the public benefit corporation really shines.

and these are free resources that we offer to the general public. So that's everything from what we started with, which is our blog with now more than 200 scientifically referenced articles on longevity, written by PhDs and MDS, to newer features like, for example, space age that I mentioned earlier, where you can take the selfie and be able to see how young you look, and then get tips for improving your skin health scores.

we have a, questionnaire quiz on our website that will give you, tips on your specific lifestyle and ways that you can make the biggest impact on your pace of aging, based on how you're currently living your life and, scientific research.

and then finally, we have a mobile app that we haven't announced formally yet, but it is now in the iOS and Android stores called Novus Life. And Novus Life offers everything from these personalized tips, and daily actions for you to be able to start to get into the habit of a longevity centric lifestyle.

to a I ChatGPT type of interface that is trained on our data specifically for questions related to longevity. to even a free biological age clock, that is more accurate than the first generation clocks, like the Horvath clock.

it was produced out of academia, and it was trained on the Nhanes data set of tens of thousands of people. And, so it's not quite as accurate as our NOVOS H blood based clock, but nonetheless, it is something that will approximate how old you are biologically.

And our hope is that this is going to empower a lot of people to see where they find relative, find themselves relative to their chronological age, and then motivate them to then take on the recommendations that we give them for slowing down their aging.

Again, all of this is completely free. That's amazing. And I love your mission to help people age better and all the free resources. Also. It's amazing.

Now question about the supplements. Are these something that should be taken daily? All of them, especially the court? Do you recommend they take breaks from them?

I'm guessing no, because others senolytics you do. But you were saying years. It's not like that. Yeah. So I've been taking, the NOVOS core and the NOVOS boost products since we were prototyping it back in 2019, 2020.

So more than four years now, I take it almost every day there are days that I forget, but that's not that often. I have it right on my countertop next to my drinking water.

So I see it every day. so in terms of a recommendation to to not take it, I mean, I don't think there's anything wrong with, like, cycling on and off of supplements, but, I think generally speaking, you don't want to cycle off of it for extended periods of time if you want to really experience all of the benefits.

So generally speaking, we suggest that people take it continuously. In the case study where we saw reversal of

pace of aging, that was people taking it every day, during that six month span.

So, what I also didn't mention about these products is that their short term health benefits from, from them specifically Nova Scotia, for example, has been shown to be able to increase skin firmness, and improve skin complexion that's typically experienced by people within 1 to 2 months of use, of continuous usage, reduction in, I can't say it for FDA reasons.

Daily Use, Results, and Closing

how do I briefly, improvement in calmness? I can't you know, we don't we don't have any impact on our medical conditions, but we can improve calmness, with some of the ingredients in our formula, which people experience anywhere from the first day of usage to a few weeks into using it, depending on their health, status, and then finally, improvements in energy, probably modulated from improvements in sleep, which then leads to improvements in energy in the days that follow.

so those those benefits are only going to be experienced while taking the product. And if you stop, you're not going to feel those benefits. Exactly. That's what I was getting at.

And you have to be consistent with products and supplements. And even though it you might not see something you've said that they do notice the short term effects.

You have to realize you're you're helping longevity and you're going to see it. That's going to take longer. Everyone wants quick fixes. No, we're looking for the long game here.

Exactly the main reason to take our products is really long term focused. With that said, as a nice to have, are these shorter term, benefits and what we find from customers oftentimes they'll they'll write a review or they'll reach out to our team and they'll say something like, you know, I was taking NOVOS core for a few months, and then, I ran out and I didn't resubscribe or whatever, and I stopped, and then all of a sudden I noticed the difference.

So they didn't notice the difference. It's almost like the frog boiling in water. They didn't notice a difference day after day, but then when they discontinued, they noticed a significant shift, while other people, they actually notice it.

Or for example, a real world example in my family, my father was using a prototype of our product before we came out with it. My mother didn't know. And in more than 40 years of marriage, my mother had never complimented my father on his complexion.

But, for the first time ever, she complimented him, saying that his skin and his complexion is looking very good. And that was only after taking our product for a few months.

Again, she didn't know he was taking it. So, that was a really nice anecdote to experience, but we've heard from many, like, countless other customers, similar accounts.

I love it. That's so cute. about your parents. So, Chris, thank you so much for sharing your knowledge and your passion. I can feel your passion, like, across the zoom call.

It's great. How can everyone reach you, find you, your products? Sure. So NOVOS is novoslabs.com And we're on all of the social networks as @novoslabs And then my personal blog is Slow My Age (slowmyage.com) and I'm on Instagram X and hesitantly on TikTok as Slow My Age. (@slowmyage) I love it thank you so much and we'll all be following you and your journey.

I'm sure. Great. Thank you. Thanks for having me.