Age Reversal and Human Tissue Therapy

It you're saying we will have a age reversal uh therapeutic working. Well, that's where it's headed. So if you extrapolate where we are next year, if all goes well, we'll have shown that you can reverse aging in a human in a tissue safely. So curing blindness. You've done this in primates already. Yeah. It works in green monkeys really amazingly well. And some of the data is just stunning. You know, you can map whether you reverse the age of the optic nerve in these animals. to Ever Young, a podcast for high performers who live deliberately and age with intention. I'm Rich Hanley, Harvard trained, military tested, and still chasing P performance at age 60. Here we explore what it really takes to stay sharp, strong, and deeply alive. So let's get to it. Within just a matter of four weeks. So this holiday season, we did a hail Mary experiment. We gave them just orally this cocktail and uh we weren't expecting anything. But we thought, why don't we just measure how fit and healthy they are?

And all the mice that were on the treatment and not the controls ended up behaving and being physiologically younger. And then when we tested their biological age, which you can do with real quantitative tests, they were younger as well. And that's just giving them this stuff Monday, Wednesday, Friday, for four weeks.

Mouse Study and Biological Age Reversal

now we want to do a lifespan study, if we can raise the funds to do that and see if we can blow away the lifespan record for mice. So there is a potential cause and effect here at play that he's describing where they're able to objectively measure the biological age of the mouse, presumably reverting it back to some extent of time. He doesn't really describe the amount of time here, but they're able to reverse the age, at least in a mouse, to some degree. He didn't describe by how much. um I'd be curious to find out how much time we talking about. He also described some. phenotypical expression of that reversing of time, meaning you felt better, you looked better, right?

So there's some description of physical objective outcome of measuring the benefit of this treatment in a very relatively short period of time. A month in a mouse's life is, I don't know what that's equivalent to in human years. I should say it certainly is a small fraction of the mouse's life, but profound to see that kind of an impact on a mouse. But we don't know, and we're talking last Christmas holiday season. So here we are in June, that was only six months ago. He didn't describe this in non-human primates. So again, we're talking about in a mouse, right?

um And we don't know to, like, what if you were to do an entire lifespan and figure out, how long does it extend the lifespan of that mouse? I don't know what the record is off the top of my head, but let's say you could double or triple or quadruple the lifespan of that mouse and break every record. That would be profound insight. And then it would go into other potential species, non-human primates, for example, and then ultimately to us. But for now, it's promising, but it really doesn't guarantee anything. um We don't know it's gonna translate into other species. We don't know if it's gonna translate in, much less translate into us. I don't know, it's really interesting to think about this. I'm currently 60 years of age. Let's say this technology comes online for humans, this pill that he's describing comes online and say, 10 years from now, and I start taking it, I'll be age 70 at that point in time. And let's say, you know, we achieve what's called longevity escape velocity. Basically, longevity escape velocity is this concept that describes the ability to, for every year of age, every birthday that you turn, you're able to reverse your chronological age, your biological age by more than a year, right? So. You're basically going the other direction. You're Benjamin buttoning your life essentially to some degree. We don't know to what degree, but it's pretty wild to think about the idea of like I turn 70 and now I'm gonna actually start to go the other direction.

What does that look like? What does that mean for disease processes that have already come to exist in my body? What if I have advanced heart disease?

Longevity Escape Velocity and Future Implications

What if I'm starting to see some early cognitive decline? Am I gonna be able to reverse those two disease processes? What if I have arthritis and I've got some bone deformity in my hands or my feet or my back? What if I've got some kidney failure? Am I gonna start to see those disease processes revert back to their non-disease state? We don't know the answers to those questions, but it's an interesting question to ask. And what am I looking, what do I see in the mirror at year 71 when I might be actually biologically 69 or I'm 75 and I'm actually starting to look like I'm. 60 again or maybe I'm looking like I'm 55 or maybe you know the science is wild beyond our wildest expectation and I look in the mirror and I see you know a 45 year old guy and I'm pushing 80 is that what we're talking about here I don't know the answers That would be great, but we just simply do not know and the mouse the earliest study He just described the mouse model. They're starting to see inklings of that answer So it's hard for me to wrap my brain around that possibility So the goal is to be as healthy as humanly possible to get to the point where, you know, I can intersect that treatment. Myself and my patients can intersect that treatment. I can offer them up that treatment in 10 years, 15 years, 20 years, however long it's gonna take them to develop this technology. And if I can keep them healthy starting now, and, you know, to think about that amazing future where, you know, we're gonna keep every disease process at bay as much as we know how to do now with modern medicine.

um And the 80 % that we just talked about, diet, exercise, and plenty of rest. If I can keep you healthy up until that point, and we intercept that technology, I give you the pill, then we start to reverse the age profoundly so, that would be awesome. That would be great. That is like, um it feels like science fiction. But it might be, it might not be science fiction. It might be science reality for us. So we'll have to see. We'll have to watch and wait. But this is super exciting. So 2035, you're saying we will have a age reversal uh therapeutic working. Well, that's where it's headed. So if you extrapolate where we are, next year, if all goes well, we'll have shown that you can reverse aging in a human, in a tissue safely. So curing blindness. You've done this in primates already. Yeah, it works in green monkeys really amazingly well. And some of the data is just stunning.

You know, you can map whether you reverse the age of the optic nerve in these animals. And it's looking like 95 % of the age goes backwards. Wow. Yeah. I mean, this is to a youthful state of the optic nerve. And semi-permanently, this isn't that you have to keep the jeans on. You can switch them off again, in which we do. We have an on-off system that we've patented and works really well. Do it for about six to eight weeks, then turn it off and the eyes stay young. They're going to age out again. But then you just turn it back on for a few weeks. That's the plan. That's the plan. I like that plan. And what type of uh age reversal do you see? mean, putting this into human terms, someone's 50 years old, they turn this on, is it taking them back to teenage years? Can you control how far back they would get? Yeah, we can control it. The longer you leave it on, the younger the tissue gets. Beautiful. And it seems very safe. There's no, no untoward effects of this treatment so far in the monkeys either. But here's what I see. I see that within the next 10 years, we'll have the ability to not only use gene therapy throughout the body, and we're already working at Life Biosciences on getting away from viral delivery, which is the current one.

Primates, Optic Nerve Rejuvenation, and Gene Therapy

And just for folks to know, know, gene therapy has been something developed since the eighties. ran into some troubles early on, but it's where you basically are using a virus to deliver, and typically what's called an AAV, adeno-associated virus, to deliver a set of genes into targeted cells. But that's expensive and sometimes maybe goes off target, you don't get all the cells you want. Well, that's the big problem with AAV is that tissue distribution is tough. And so we need better ways to either get those viruses evenly throughout the body um or use other things like what are called lipid nanoparticles. are also… Like mRNA vaccines. Exactly. Though, know, for those that questioning what about the vaccines, maybe we get into that. know, vaccines got a bad name in the last Yeah, but this is obviously not a vaccine. This is you deliver genetic material inside these little particles. And those, there's really good technologies actually.

There's a company that I'm advising called Ligandal and they use AI to find proteins that you could put on the outside of these little particles and direct them to anywhere you want them to go. So look up Legando. They're quite an incredible company. So lipid nanoparticles with proteins on the outside of the lipid nanoparticle. And you can tell, you you can basically direct it wherever you want to in the body. That's pretty wild science. So getting back to what you asked me about, what does the future look like? I think we can either go into the doctor and have an injection of that genetic material and we become transgenic humans that we can turn on these three youthful

Yamanaka genes they're called. And every time we want to get rejuvenated or we have an injury, we need to heal quickly, we turn them on. How do you do that? Well, we've engineered it so you can just take an antibiotic for a few weeks. It's doxycycline.

So you take a course, it's pretty safe, actually very, very safe, and you turn it on. Now that's what I can see happening with already technology that's going into humans. He's talking about turning on the genes with doxycycline, right? So take the Yamanaka factors, turn it on with doxycycline, reset the epigenome back to a certain place, and then… those cells begin to live their lifespan like they did before. And then let's say you develop another disease process or you begin to age again, you can take that the same Yamanaka reset and then bring it back again. So we're talking about a multiple, who knows how many times you can do this. The answers aren't readily available yet, but we're talking reset after reset after reset. So if I'm able to reset my biology back to the point where I'm younger, Does that necessarily mean that I'm resetting all the genetic information? um I think invariably you're going to have still some genetic drift despite that reset, because we're talking about an imperfect system that's very stochastic, the algorithm is less uh binary, less discrete, more stochastic, more um analog than say a computer simulation where you're taking zeros and ones and reverting them back to their previous state. it's either on off or zero one, it's more uh fluid. And so despite how many resets you do, you're still gonna have some genetic drift, still some detriment to the cell, still some aging is going to occur. So I think it's like, know, Benjamin Button all the way back to 20 and you just stay there forever, we're still gonna age, we're still gonna die, but it may take us 200 years or 300 years, we're talking way off in the distance.

ah But let's say we're able to double the human lifespan in next 10 years, like for real.

Doxycycline-Activated Reprogramming and Lifespan Speculation

You're still gonna die, you know, if we live to be 80 right now, you're still gonna die at 160 potentially, right? But you'll be healthy very healthy up into 120 130 140 and it won't be till you're 150 This is all fear theoretical, you know the last ten years of that of your life You know, you've done all the resets that you can using the almanac of actors and whatever Science has come online at that point and you're still you know gonna succumb to this loss of information It's just taken longer to lose that data than it currently does now, which is still very encouraging. But I don't know, it's interesting. I'm interested to hear what you guys think in the comments about that whole process about, if I lived 160 and I look like I'm 60 years of age, at age 60, I feel great, I'm able to function. It's like, how do you find meaning for that much time? you have, now you have children, grandchildren, great grandchildren, great, great, great, great grandchildren. You've built three, four, five, six different careers.

You may have one partner, you may have gone through multiple partners because they've either passed from other disease processes or… I mean, it's just a whole new way of thinking about life and about the universe and our place in it. What does it look like for the world in terms of our economy and how do we keep everyone happy and healthy and working together and not combating ourselves to the point where we destroy ourselves? All these questions are so beyond my capacity, but they're fun to think about. And I do like, you know, at least in the immediate context, the idea of spending more time with my kids, spending more time with grandkids once I have them, and potentially great grandkids, enjoying my career. expanding my career to maybe other careers. I love medicine, love storytelling, filmmaking, all those things that I love to do. I like the idea of not having to shut that down in like two more decades.

If I'm gonna live to be 90, let's say, in my current, know, if I'm lucky I might get to 90, given my uh family genetic biological history. That's only 30 years away. That's not very long. If I can double or triple that. That changes my viewpoint quite a bit in terms of like what's possible in my life. So I love this kind of science because of that. It like opens up my mind to like these crazy possibilities. So when we're talking about, you know, David Sinclair's work and the work of others in various laboratories, similar to his around the world, I get pumped.

I'm super excited about this.

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and is not intended to diagnose, treat or cure any disease. I'm Richard Hanley, a licensed and board certified physician associate, PAC, trained at Harvard Medical School and the USC Keck School of Medicine. And while I do hold two doctoral degrees, including the Doctor of Medicine and Doctor of Health Science, I'm not a licensed physician. I also hold a master's degree in healthcare quality and safety from the Harvard Medical School and bring over 30 years of clinical and executive leadership experience. I continue to serve as an interviewer and admissions assessor for Harvard Medical School's Master of Science in Healthcare Quality and Safety program. That said, the views expressed herein are entirely my own and do not represent the official views of Harvard Medical School.

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We'll see you next time.