How Gene Therapy Could Redefine Longevity: The Science of Aging Backwards Transcript

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Introduction to Genetics and Stem Cells

During that period of time, I fell in love with genetics, you know, and it started with the stem cell. You know what makes the stem cell, so potent in repairing the body when it has the same genes as every other cell in the body.

And so my, my sort of rabbit hole went into a myriad of, of, of spaces of how, genes could, potentially help us live longer and healthier. Welcome to Doctor Talks, the podcast where every episode leads to a healthier you.

Join us as we navigate the world of optimal health, uncovering groundbreaking strategies to conquer chronic disease. In each episode, we'll bring you the latest insights from leading health experts, medical innovators, and wellness warriors.

If you're seeking to transform your health journey, or if you're looking for answers to burning questions, you've come to the right place. Get ready to unlock the secrets of lifelong health and vitality.

This is Doctor Talks, real talk from real doctors on the issues that matter to you most. Hi everyone. Welcome to today's show. We have the privilege of speaking with a true pioneer in biotechnology and gene therapy, Liz Parrish.

Liz Parrish and the BioViva Origin Story

She's the CEO of Bio Veeva and has been at the forefront of reimagining what is possible in the fight against aging, not just as a researcher, but as a trailblazer who became Patient Zero back in 2015, where she went from undergone supplemental gene therapy to push the boundaries of human health and longevity.

These tackling the hallmarks of aging head on, from telomere lengthening to muscle regeneration, and advocating for a future where gene therapy isn't just a luxury for the few, but an accessible solution for everyone.

Today we're going to delve deep into Liz's journey. We're going to look at the progress she's made since her initial treatments, and the far reaching implications of gene therapy on our quest for radical life extension.

Most importantly, we're going to explore her vision for a world where lifespan is extended, its lifespan is optimized, and the very nature of being human is redefined.

Liz, welcome to the show. Thank you for having me. And and I just want to do a shout out, to you because you did that in one take. You're the most are articulate, intro that I have ever had.

So, thank you so much. Oh, my gosh, I receive that. Thank you so, so much. Yeah, I see you. I know you want to voice for radio. Perfect. I love it. Yeah.

I'm just like, okay, I've got to make sure I don't fumble. So. Okay. Beautiful. Well, I, you know, this is, it's an honor. It's a pleasure. I've wanted to have this conversation with you.

I have fangirl over you for so long as for so many reasons. Because you really are everything I've just said. You are such a true pioneer and a visionary.

And so you know what's beautiful about this format here at Rad Cast was we have experts and enthusiasts alike and people that are just brand new to this conversation about what could become possible.

And so I want to dive right in to your work because you've been a bold advocate for gene therapy and and the fact

that and I know you've told the story many times, I'm going to try to twist it in a way that we can give a fresh perspective.

But you were one of the first people to undergo experimental treatments on yourself. So kind of looking back at taking that step, how do you feel that your decision to become Patient Zero has actually influenced not only your self and your health, but really the field of longevity in gene therapy overall?

Well, thank you for asking, Matt. So just in case somebody has doesn't know, our history. So in 2015 we started the company and we did it by doing the first experiment, in biological aging with gene therapy.

And I took two gene therapies. One was telomerase reverse transcriptase that lengthens the caps at the ends of the chromosomes that, shorten as we age and are, associated with lifespan of humans and 23 other species.

And then, the second gene therapy was full of and it was a gene that had been through safety and efficacy for Beckers and muscular dystrophy. But, its potential for an aging population was substantial.

Of course, even prefacing that with every gene that our company chooses is for, can be repurposed for a childhood disease as well, which was how I got started.

But, so anyway, we we did this, experimental gene therapy and I think that we knew that we were definitely, breaking new ground. It was not it was not classy.

It was not like a beautiful movie or anything like that. It was pretty, rough and raucous. And we were trying to find a location and and trying to get the gene therapy manufactured, and, and we actually didn't know what would happen.

But as we suspected, by doing all the literature review, I became healthier, and that was fantastic. But in the meantime, I think we did everyone a service by by breaking almost everything in the biotech industry.

Patient Zero and the First Gene Therapy Experiment

So after we, we did the gene therapy, we kind of thought, well, you know, people will be very excited about this data. You know, self-experimentation is a historical, premise for getting medicine moved more quickly.

But actually, we found a lot of really, unsatisfied, characters out there of whom, we probably broke their business model. We probably broke how, health care was, was done to begin with.

And we had some disgruntled scientists, and investors, out there and especially companies who had raised an enormous amount of investment but probably didn't have a drug that you could take with, with great benefits.

Yeah. It's interesting, just in some of the conversations we've already been having here on the show, you know, there is this fascinating bridge between what's really happening in the research space versus what's happening in the clinical space.

And I love that from a research side. And I really respect you because you did what hasn't been done. Like you did a very bold move. And overall health care as an entirety is very conservative in how it's moving.

And so you did something radical. You did something bold, you did something that did push the envelope to say, hey, we're going there. Who's coming with us?

And yet, you know, because I hold such a huge vision of what is possible for for just human potential. And I look at what's going on, and I see our practitioners in the field that the, the idea there's still such a conservative, fearful, hesitant approach.

And I understand it's this it's this mix of best practices and research, paired with, you know, we have to be safety

and standards and compliance because everybody could be liable.

So it's a very weird space to say, how can we do the bold thing? How can we actually take the needle moving activities when implement it. So for you like you did the bold thing, how what did it take within you to to actually say, doesn't matter, I'm doing it.

I don't know what's going to happen. And and it's an interesting fallout that you said, like you kind of ruffled a lot of feathers. Talk to us about how you came to that choice point within yourself and are you happy all these years later with kind of the ripple effect that you've seen from it?

Yeah. So, from 2011 to 2013, I volunteered my time for the advocacy of the use of stem cells and regenerative medicine. So I had sort of a strong basis of what was out there during that period of time.

I fell in love with genetics, you know, and and it started with the stem cell. You know, what makes the stem cell, so potent in repairing the body when it has the same genes as every other cells in the body.

And so my, my sort of rabbit hole went into a myriad of, of, of spaces of how, genes could, potentially help us live longer and healthier. But, in 2013, my son was diagnosed with type one diabetes, and, and hence why we choose every gene very carefully, both for a childhood disease and for aging associated disease.

So we can actually hit both sides of the age gamut. So, when we when I was in the hospital, you know, they just basically, you know, every time I asked about genetics or bio banking, pancreas or stem cells, you know, they looked at me like I was crazy.

And they said, that's experimental medicine. We don't use that in children, which actually sounds very logical until you look at the research. The research has been around in some cases for decades.

Positive outcomes, very few negative outcomes. We with the gene therapies that I used, in my first experiment. And then since then I've done other gene therapies as well with new genes.

But, those genes themselves had already been through, a human analysis. They had lengthened the life of model organisms and several species. So the one had been in clinical trials.

It was safe and effective. Why not use it in an aging population and then perfect it for childhood, muscular diseases? It just it wasn't fitting in my head that these new drugs would come out with all these side effects.

And yet the medicine that doesn't have side effects, gene and cell therapy, was not being allowed to be, used and that doctors and nurses had such a negative, knee jerk reaction to it.

So, after his diagnosis, I started traveling around the world looking for cures for kids. It just was by happenstance that I ran into a conference about aging.

I met, George Church, the professor of genetics at Harvard, and I asked him, to join the company. You know, since then, I. I'm really glad that we did what we did.

You know, we we we went head down. We spent two years for my son's diagnosis researching, what gene therapies would be the most appropriate to have the, the best beneficial outcome to the whole population and childhood disease.

And we chose, those two that I started with heart and full of statin and, the what was the effect? I mean, the ripple effect has been amazing.

Lifestyle, Epigenetics, and Healthspan

The FDA has approved more gene therapies than ever. I think they've actually approved more gene therapies than

cell therapies at this point. You know, we're we're pushing the regulatory bodies, to really go forward.

I went to school whilst running this company and got my MBA, and in, obviously in business, but then, I did my thesis and regulations, and now I work with countries around the world to, help streamline pre regulatory routes so patients can get access.

And, you know, our voice which once sort of shattered the minds of people like, how dare you just go use an experimental drug. But remember, like at the point of experiment, these weren't very experimental.

They had been in so many studies, they had proven over and over again that they worked. The one gene therapy just had never been in a human. And so what pushed me to do it was, you know, living with my son who has a, disease every single day, you know, and, and it's a reminder that we need to move fast.

We need to create medicines so that people have more healthy time. And, you know, when we cure a childhood disease, we we don't want them to just live from 21 to 35 and then start getting aging associated diseases.

We need people to live healthy, well and longer and, and and that will, create the, the best outcome. But you know, now we see companies, trying to go to market faster.

We see, people changing, how they're making their drugs. And I mean, I, as I say today and in this climate, if you are not working on a drug that you would want to take because everything is moving towards actual health care instead of sick care, we used to just treat symptoms.

You know, you have cancer. We treat the symptom. You have heart disease. You know, we we try to lower your LDL. It's like we don't actually cure it. Now we're working towards curative medicine.

If you're not working in a drug company that makes drugs that you actually want to take before you get sick, then you're you're in the wrong business.

And and basically, you know, that was what that was the message. And if you're a company that's raised hundreds of millions of dollars but never gotten a drug approved, it, you know it.

There's probably something wrong there. We need to be more efficient with money, our time and our energy. And I think that, you know, regenerative medicine is the space for that.

Yeah, there's a lot of exciting advances coming, and we're going to keep diving into that. And I want to take just a moment and bring us into a practical, everyday approach.

So I appreciate the the dive into genetics. And so one of the things with the first treatment you did at impacting length of telomere, obviously we know there's a lot that shows lifestyle action.

So if we think through the epigenetic lens of what actions how's our environment and the way that we're living and engaging within it, how's that influencing and informing that genetic code and that potential to express or to repress?

So I'm curious, you know, how do you see the data stacking up? You know, what role do you really advocate lifestyle. And how far can that get us in modulating genetic expression by way of epigenetic signaling?

How far can we get with lifestyle? And does the gene therapy then take us further? Is it the same. Is it it totally different categories. How would you help us?

Just the layperson out there kind of going, okay, I'm really fascinated by this. It's not readily available yet. It is highly it's not very cost effective yet.

So where do I begin with understanding that if I can move the needle at that genetic level, I could have a healthier,

longer life and potentially mitigate my risk of other possible diseases that are associated with aging.

The longevity revolution is about more than just searching online for a few hacks, or any one of us moving our biomarkers in the right direction. It's about coming together to learn, share, to connect and create the unlimited future we want.

That's why you need to be at Rad Fest 2025, in Las Vegas from July 10th to the 13th. Rad Fest the Revolution Against Aging and Death is proud to be partnering for the first time with Doctor Aubrey de Gray and Longevity Escape Velocity Foundation.

The form the single most comprehensive, advanced, informative and inspiring event on age reversal for a general audience. Meet the people you want to make forever with Rad Fest 2025.

Take advantage of lower advanced pricing now at Radford Scott okay, so that's a that's a lot. Let me just go back and unpack it from from the very beginning.

So, I wrote a foreword of a book called Expressive Origins. And it's all about, epigenetics. So if you want to go look that up, you can, that's, that's from, the chapters themselves are actually written by, doctors and practitioners and specialists and epigenetics and, and so epigenetics is a fascinating thing.

And actually, we know now that we are born with a lot of epigenetic expression, from our parents and maybe our grandparents and maybe our great grandparents.

And so, this is all very interesting, for sure. But, I don't know how to say this. It's the law of diminishing returns so you can live, very healthy. You could have a where where everything would start perfect is, in utero or actually with your parents or your grandparents lifestyles.

Okay. Because if you're just going to count on what you were born with, then we know how long you'll live. But we don't know how healthy you'll live. So you might be born with some, precursors of epigenetics to be have anxiety or depression or various other things that might be genetic or epigenetic.

And so those will be things to overcome. You might have been born in a family that was very stressful when you were young, and that will actually pre age you as well.

Or you might have been born, a minority. And we know that that will pre age you as well. Then you get control of your life loss hope sooner than later and you live as healthy as possible.

And so for your middle years if you don't want to intervene, this is where you're going to get the biggest bang for the buck. Towards your later years. Is living healthy.

Don't drink alcohol. Don't smoke. You know, try to get some good sleep, but mostly de-stress yourself because stress itself will, destroy you even if you do everything else, correctly. Probably.

That's why some people choose to drink beer. So, yeah, I would not suggest that I would not medicate. Stress, I would, I would meditate, stress, don't medicate it, meditate.

It. Okay. And then and then you'll get through it. So you, you you can obviously, there create a better middle of your life. And here is for instance, now we can't say exactly what my dad was born with in predisposition, but his dad died in his 50s.

So my dad took his health very seriously and when it was not fashionable, started running in denim jeans. I'm not kidding. And, he started running a few miles in his Wranglers.

You know, my tactic. You know, and then, and then he started running marathons, and he started, you know, taking some, some of these things, nutritional supplements that, you know, we had never heard of before at the

time, little garlic pills and Sol Parlamento and, vitamin C, you know, just little, you know, not tons of it, just a little bit of it.

And, he lived to 82. I, I'm happy. Or 81, actually, I'm happy to say we extended the last two years of his life with gene therapy because he did come down with Parkinson's.

But anyway, that goes to show you, if he had the predisposition of his father, which he he might not have because all of his siblings who didn't do the same also lived decent years when one died young.

That could show you that you could you could make a difference. Right? But if you want to actually extend the healthspan and the lifespan beyond your predispositions and your best case predispositions, because that's all you're going to get with lifestyle, then you need to intervene.

And that's where the gene, therapies come in. The cell therapies and, and, and some of these new, substances that are looking to reprogram the body, maybe, bio electrically, that we're going to start seeing enter, that, that are going to be a game changer.

So I'm working on two companies that have aged for chemical Reprograming they believe that they're they are resetting the epigenetic age of the cell.

Gene Therapy, Cell Therapy, and Longevity Escape Velocity

Then we have the gene therapies that come in and they they turn up function, gene function that you lose over time, or gene function that you have that's associated with species that live much healthier and longer than, than we do, within their, their time frame.

And, and then new ones that are associated with different, Gerald, protect your protection and things like that. So, and then the cell therapies, you know, I'm working with a company that, is taking your own cells, your own stem cells.

So, they are epigenetic reprograming them. So they are youthful. They're your cells, but youthful. That means they can implant. So if you take these cells from somewhere else, they can maybe drive up some regeneration, but they can't implant these ones will be your cells. They can implant.

And then we're going to enhance them with gene therapies. So this will be for neurocognitive muscle organ failure and things like that. So it's getting really exciting.

But this is, this is the space that you need to be in if you want to defy the odds. This truly is the future of medicine and health and well-being. And so when I was able to sit down recently with Aubrey de gray, as he's been an advocate and telling us of a future where longevity escape velocity is a reality for so long, it's like, well, you know, we're 50% of the way there.

And he's like, Melissa, we're ten, 12 years out. And so I'm really intrigued, Liz, with everything that you're everything that you just said sounds so exciting, so fascinating.

So where would you say that gene therapy cell therapies are really kind of positioned on this timeline and in as, as a cornerstone, if you will, and helping us to achieve this longevity escape velocity, like, is it ten, 12 years, you know, where do you see what's coming as being an accessible reality?

To actually actually get us there with this longevity escape velocity concept? Well, I mean, longevity escape velocity is just basically hitting the ground to where we are moving so quickly that you start taking the first therapies, and then you get to the therapies that help you ultimately, you know, I suppose in, in our companies case, you know, create homeostasis, use you essentially regenerate.

Faster than you generate, which is kind of what's aging is a cellular degeneration over time. So, I mean, I don't

want to I don't want to get befuddled in other people's, I don't know, definitions of things.

Sure. But I would say, you know, with the gene therapies, I would say we're already those those people who are participating in those. And there are hundreds of people now that, that go to locations outside the US to take these gene therapies.

I think that they're already on the track for it. I think that, you know, the gene therapies themselves could probably slow aging at least by several years.

And then eventually we'll reverse aging, with, you know, whatever the protocol is to that will hit all the hallmarks of aging. We can hit a lot of them with gene therapy, not all of them.

And, so, you know, I would say that a lot of people are on that track, but when does that happen for everyone? Well, you know, that is a good question.

And people really if you just heard what I said, you should be a little enraged. You should realize that people with scientific advisors, people with high intelligence and, and an a lot of money in their bank are able to access things that everyone else can't correct.

And we need to make affordable medicine, and we need the regulatory system to allow these technologies. And so the most sick people, the most terminal people can get access, and then we can create the social safety profile that the general population needs and wants, and therefore also an affordable therapy.

And that's a completely different story. So if you go out in the wild and you you have the wherewithal, you could find these type of technologies that already would help you probably not guaranteed, but probably live healthier, longer.

I'm saying not guaranteed because biology is tricky and, and and I'm not a medical doctor. That's not my job. But, if you're sitting in waiting, then I would say you need to do something.

And that's why the Coalition of Radical Life Extension is going to be holding a march on Washington, DC in 2026, in which people get together and demand access.

And I'll tell you if this sounds a little crazy to new listeners, this is not this is how Aids patients got access. There is technology. There is a lot of regenerative medicine out there.

I was just sent an article yesterday. We can regenerate hearts, that have low, blood fraction. So basically they're pumping small amounts of blood. They need to pump larger amounts of blood.

There's one gene that when they, put it in pigs, they're able to have full, let's say, pumping of the heart. So you understand what I'm talking about?

This is this is this is critical. Let's see. Liver regeneration. Liver regeneration. It's already been through phase two clinical trials. I've got a company trying to raise for phase three.

That means it's safe and effective. And with a tiny dose of gene therapy is regenerating the liver. As far as type one diabetes, there is a known treatment with a patient's own cells.

You can program the patient's own cells, put them in the liver or the muscles, and the patient can make their own insulin. We do not need to be dependent on these diseases anymore.

We can lengthen telomeres, which should give you a healthier and longer lifespan. We can increase muscle mass critical, you know, 7% of the population dies from frailty related injuries.

We can make them stronger, especially when we put their own stem cells in and inject the gene therapy because in their own stem cells can help to create those, those muscle fibers, that they need clothes.

So I've done the gene therapy clothes. I did it intranasal and I've done it injected, into my body. It is associated with better cognitive outcome. We published a paper in like 2020 that showed and in five patients, four out of five with actually advanced dementia, suspected Alzheimer's had cognitive benefits, lasted for two years.

Not too expensive of a therapy. Insurance companies could be covering this. People could be staying home knowing who their loved ones are for longer. Until we find a cure that those are life extending, medicines.

Those those are those are critical. And there's now 12 approved gene therapies for monogenic disease. Those are approved all the way through the, the, the FDA.

But they're for very rare diseases. So very few people benefit. So we know it works. It's proven it's curative medicine. We need to move much more quickly.

So you need to get out and demand access to these technologies. It's not flimflam me. It's not something that's maybe somewhere out there in the future and we're still working on it.

It's done. Go demand access. Stop letting your loved ones die. Stop losing your parents, your grandparents and your kids. Are you ready to redefine aging and unlock your full potential as a longevity leader?

At the Human Longevity Institute, our world class certification programs train doctors, coaches, and wellness professionals. How to deliver cutting edge, integrative longevity health solutions so people can live better today for longer, healthier, and more vibrant tomorrows.

If you're ready to join the Longevity Revolution, visit Human Longevity institute.com to enroll and become a practitioner today. What I love. Thank you so much for your passion and for the call to advocacy.

That's that's so needed. And I think what you just simply shared with us all is that we're sitting at an important time where we now realize the way that we've done things we no longer need to do things.

It is an outdated model, the way our current health care system is set up. It is a disease management model, and we live in a time where we have proven, proven therapies that can be corrective and curative in nature.

And so let us not sit by and continue to just accept what has been, but to really go out and begin to demand more of what is here now. And so, Liz, what you also just help to highlight is this is not a conversation just about for for the extremely wealthy that want to extend their life.

Of course, that's great. I want our listeners to realize why longevity is such an important conversation. It is the it really is the vehicle through which we have another way to look at how the body is either breaking down or building up.

So longevity as a conversation allows us to realize that the faster the rate and pace of biological aging that correlates directly with a faster a greater likelihood of chronic disease breakdown, leading to greater amounts of all cause mortality, meaning correlation.

And we find oftentimes a lot of causation as well. So so longevity is something we want to care about as a way to say if I slow down aging, I can slow down my rate and risk of disease.

But the same things we're using for aging, they're also corrective and curative in nature against disease. So that all said, Liz, you made such an important point.

Where are we in democratizing these therapies and technologies? Like how close, if you had to look in your magic ball and wave that wand, where do you feel we realistically are in making that more accessible to the masses?

Well, interestingly, we're making headway. So Bio Veeva can't treat patients because we're a US company. We don't have any licenses to do a clinical trial.

We've tried, and they just keep sending us back to do animal studies, which we have human data and we have animal data. So I'm not sure. And Biden signed into law in 2022 that we don't need animal studies anymore.

Access, Cost, and Democratizing Curative Medicine

So I'm not sure where they're coming from there. But, we've realized that, our best interest is to license the technology. So we license the technology, and these, these groups, work where they can legally, in the world for consensual use.

Investigator initiated clinical studies or, under the legal, you know, framework of where they're actually working and, and that's fantastic. And already they, they have made the, the therapies more affordable.

Let's say they're still unaffordable for most people, but they're more affordable. So when we look at a whole body treatment of gene therapy in the United States, we're looking at a minimum of $2 million, for that treatment.

And that's for a if your child is born with spinal muscular atrophy, you need 2 to $5 million or the child dies and, that's pretty criminal. Because offshore, in a human adult, some of these companies are doing these therapies for as low as 250 to 350,000.

And that's within the realm that an insurance company would cover. If an insurance company would actually look at these therapies and start covering them.

So and then when you think about that, so that's a very small audience. Still, if you think about a thousand people coming, you're talking about the therapies being $50,000.

You know we can actually create a model. And and I think actually the US health care system has done a very, very good job of trying to prove that gene therapies are too expensive, but they're not.

It's it's they're expensive, no doubt. They're expensive, but they're not that expensive. And and this is we live in the land of greed. The truth is, if you help a lot of people, if you made a dollar, you'd make $8 billion if you helped the whole world.

So, you know, we need to get away from this mindset, that we need to make a lot of money each time we need to make a difference. And then if you're making a difference, then you make money.

That's how a company should work. You make you make money on a value proposition, not on the back of sick people. Yes, it makes me think about, you know, Pennywise dollar foolish as a, as a phrase.

Because if we really look at what we pay right now, just in managing sick care and how that extrapolates out year over year and additional diagnoses and additional medications and comorbidities and everything that goes into one single patient that's just being managed, versus if we were to come in at the beginning in a very proactive and corrective way and be able to use these therapies that are, again, in your verbiage, they're curative in nature.

And so now all of a sudden, it might be a higher price tag up front. But there's you don't have all the back end costs. And instead you have gain. Because now you have a healthy individual that's able to go out and continue to show up and contribute to society, to life, you know, putting money back into the economy versus growing and growing and growing costs long term.

So I think to your point, there's an interesting perspective that we get to switch and look at it in a more proactive and intelligent way. And so I want to I want to hypothesize we're going to talk a little philosophical for a moment.

If you're if you're willing, there's a beautiful paper out by David Sinclair. It's a peer reviewed paper. It's like the cost of aging. It's a US centric, the I hate putting dollars and cents, on people's lives because we know that it's bigger than that.

It's like terror management how our loved ones are dying with dementia and cancer and, you know, dying at the table of a heart attack every 33 seconds here on this, podcast, somebody is dying of a catastrophic heart attack.

And you know that is, it's it's it's very scary. And in the long term care, it takes away from, people's lives, their livelihood, and it starts to dull down.

Well, your essence, because you're you're. I mean, watching a loved one die is an incredibly terrible thing, but, David Sinclair did a paper on the cost of aging in the U. S.

alone. Could save $38 trillion a year by. Listen to this slowing aging by one year. We could do that. We can already do that. You want we? Yeah, it's my favorite.

I talk about it all the time. And to give and give perspective to what Liz is saying. Not only can we save $38 trillion right now, we spend on average 3.8 trillion every year, which is 19% of our gross national product of our debt, like 20% of what we're paying every year is going to manage sick care.

And, you know, there's a lot of people out there saying, if we keep doing it the way we're doing it, we could. And people are living longer, but not better.

We're living at a greater state of breakdown, dysfunction and disease, which comes at a cost. This could really cripple our economic. You know, vitality as as a country.

And what could that then do globally? So think about it. 3.8 trillion is our cost every year to manage sickness. If we can extend health span by one year, we infuse, we save 38 trillion, not 3.8 trillion.

38 trillion is a massive game changer. And to me, like that's the real story. And that's something we get to empower ourselves with versus to your point, Liz, living in a fear mongering kind of, culture or idea like, oh, not enough, not enough.

No, there's so much, there's so much. And we need more voices like yours to really to inspire advocacy for us to, I call it, you know, flip the coin to the it's the same, same coin, just the other side.

So what were we to what if there's a benefit versus a cost on there is there's quite a benefit indeed. So as we realize that there can be benefit, there can be massive gain.

We are living in a time where we can correct, we can cure, we can extend health, span and lifespan. What are the sudden happens when we are helping people live healthier, longer lives through gene therapies and cell cell therapies and reprograming what what type of are we even ready for it?

You know what could happen? And this is again hypothesizing. Just curious of your take because I know you've thought about it. I'm sure you've had many conversations around this because this is what you do every day.

You're getting up and going out there to extend lifespan and health span. So what happens when we actually do it? Is there is there a problem with that living longer, what it could do to society?

Well, I mean, I'm sure that if we went back, three, 400 years and we told people how long they were about to live as a species, not those people, they would probably freak out and they'd say, we don't need that amount of time because, you know, we're we're happy with, you know, building a fire every night and barely surviving.

And, you know, four of our five children dying of of illness and, you know, dying of infections in our teeth and in our, in our relatively short lifespan.

And so, you know, to ask that question is kind of to like, almost people don't really know how to put that in their head, but but I guarantee you, when people are living longer, healthier, they'll, they'll just fall into that time.

They'll, they'll just, you know, I mean, you know, I think what's really important is, you know, I often ask people, you know, what's the most important currency in the world?

So is it the Swiss franc? Is that the euro? Is it is is it the British pound? It's actually time. And so, you know, time gives us the ability to do it, to do a lot of things.

But once we hit this, you know, I mean, I believe a society we're building something, I believe that a meme has run through us for a very, very long time.

We started writing about this, a long time ago. Thousands of years ago, we started writing stories. Our science fiction writers, started writing about technology that we created.

I believe that we're building something. And the sad thing is, is that most countries are not educating all of their people, because we could be building it more quickly.

We don't have to be afraid of science and technology. And, what happens when we break this and an AI is is coming in along with us? I would say we're easily running in parallel.

A lot of people think it's advanced, but if they knew what was happening in medicine, they would not think that we need to educate our people. We are building something incredibly beautiful.

My job is to keep biological relevance whilst AI is is developed, and how whatever this turns into is, is already, in a way, almost clandestine. We are building towards the future, and we need people to learn about the technology and see it for what it is and, and actually help to build it and, you know, put their stake into that.

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And, and by not educating most people in the United States, by making education the cost of education so high, we have lost a million, at least geniuses that could have helped us solve this globally, probably a billion.

And we are working towards a better future. And again, we need to we need to change the way that we do most things to actually get to the endpoint that we want to be at.

But, there are many of us here that obviously are, you know, working for the betterment of, of people and, and making this come to be. And, and I really, am intrigued and excited and I can't wait to see, what comes next after after we've achieved this, number one, people are going to live better, longer and healthier people who maybe lived 60, 70 years not doing much, may then go to college for the first time because we will realize the value of an education.

They may start doing things, you know, a job or have an idea, because at the time that they sat doing something else to know how to solve a problem or what needs to be solved next, you are going to see like pieces of the puzzle start to come in, and I hope, I really hope that, more people get involved in that.

And, you know, I don't I don't believe in a tiered system. I think that a person can come from any background and make a huge change in the world. And so those changes will be fit in like puzzle pieces.

And what we're building as humans will eventually, be shown to us. And then, of course, will build on top of that. And so, I don't know, I, I just really, I'm, I'm very optimist tech and, and I'm very excited, but, you know, you know, as, as well, as much as I am excited, I'm also concerned because, you know, there have historically been bad players in the world who might use certain technology, against, humankind, or I, but, I needs to know that that we are the solution.

We are a very special species. All species are. I'm a vegetarian. I love I love all animals. It's a very special planet. We need to take care of it with all of this technology.

And I think that it will just it's just going to be one page after another is just going to be turned. And we're going to be amazed. I'm not in the gene therapy space and I know everything.

I can't wait till the page turns. I so love your perspective. It is so beautiful. And I am sitting here just feeling, you know, personally in invigorated to just help everybody hear what you have just shared, which is, you know, for you back in 2013, it started with what would have been potentially as a, as a mother, a scary diagnosis for her child.

But it inspired you to look at things through a different lens and to really go deeper and then to go on your own journey to share not only for your child, but for yourself and then ultimately the ripple effect for humanity.

But you just started to look at things differently. And, you know, and that's really what I'm hearing. Like we have been we have been told stories of limitation for a very long time as a human species and yet more as possible.

So if we're willing to just ask questions instead of could there be a cost, will could there be again? Do we have to does aging have to look a certain way?

Well, what if it didn't? Are all diseases only meant to be diagnosed and managed and live on pill after pill and more pills for so long until you're out of here?

Well, what if it didn't have to be that? What if instead of managing, we could correct. We could cure. And sometimes it can begin with as simple as a what if?

And start to allow our brains to just dream and envision, because then it's kind of that anticipation of turning the page and starting to see a patient.

It's so beautiful. It really exactly. It's so, so beautiful. So I mean, Liz, I would love to sit here and just continue to share time with you for so long.

There's so much I want to dive into. We didn't even get to today. Sorry. My dog is, ready first, she's trying to get out the door right now. She's like, if she barks, mine are going to go off.

Like, just like you have to wait. But, definitely we're going to need to have you back for a deeper conversation later in this year. There's so much coming.

Will be excited to I'll be with you at the rally. I'll be excited to see you at Rad Fest as we have the ten year, you know, just a huge movement of continuing to let more and more people know what is possible with these therapies, with the future of medicine, with the future of health and very human potential.

So thank you so much for everything today. I just, I, I honor and I respect you immensely. So thank you for your contributions to humanity. I appreciate you so much.

And I hope that everyone listening is very excited about the future. No matter what your take is on it. The future is definitely for the flexible mind.

So be flexible. And as you said, ask the what if? What if we do this and where? Where can people most, best. Where would you like people to find out about you, about your work or where you'd like to really kind of guide them in their own, journey with all things gene therapies?

Well, you can find us at Bio Vivo science.com, and you can follow Bio Viva, or you can follow, my work on LinkedIn. Because I do we I work with several companies, I work with regulators.

I have a regulatory, platform, and I am always posting the latest in gene therapy, which is massively exciting. And so if you're really interested in that, what potential superpowers you might pick up, whether they are to defeat the ravages of time or see better or, have more muscle mass or what, whatever it may be.

Then please follow me. You can also find me on other social media platforms as well. Perfect. We'll make sure to have all the links in the show notes below, and I would hope that all of us leave this conversation today, realizing that no matter what things have looked like in the past, we are at this beautiful tipping point in human existence where more and more is being revealed of our pure, limitless potential to live longer, to live a healthier, more vital and vibrant lives.

So thanks as always for tuning in. Go out and continue to be bold, stay curious and allow your aliveness to flourish. Thank you for tuning in to Doctor Talks.

We hope today's episode has enlightened and inspired you on your path to optimal health. Each day is a new opportunity to make choices that empower your well-being.

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