POD OF JAKE
#79 - ERIC VERDIN
AI-GENERATED TRANSCRIPT

Jake 02:18
Thank you very much, Eric, for joining me on the show today. It's a real pleasure to have you on I've been into longevity for a while as the podcast suggests. And being that year president and CEO of the buck Institute, you're someone that's been at the top of my list tab on the podcast for a while now assets, it's great to have you. For those who aren't so familiar with you or with the buck Institute, I think the best place to get started would be to bring everyone up to speed on your story. And as I often ask my guests, it would be great if you could sort of start off as early as you're willing to start and bring us forward to where you are and what you're doing today.

Eric Verdin 02:55
Well, thanks for having me, Jake. I think it's great. And thank you also for what you're doing for our field, I think we we are in a truly exciting field of research with enormous implications for medicine and humankind. And I just think it's always great to hear people being excited about what we do. So you asked me, you know, to give a little bit of sort of personal color in terms of how did I get into this field? Well, I by I've always wanted to be a scientist. And that started you know, really small at age. Just having been offered a microscope is a kid that just opened by work by my eyes to a world that was different from what anything I had ever seen. And just from that one day, even though I didn't really understand what it was to be a scientist that that's all I was thinking about doing. And I took a slightly unusual route which was to go to medical school. And, and this was on the, on the advice of a family friend without you know, this will give you a different look at biology and you can you can do biomedical research. And so this is what I did. I trained in Belgium, where I'm originally from, and then came for after my MD and some clinical training came to Boston for a postdoc with Ron Gunn, that the Johnson clinic at Harvard and and then essentially continued my career, you know, been hopping from institution to institution I worked at NIH, I worked at University of Brussels that worked in New York, and eventually made my way through the West Coast and to the buck Institute where I've been for the last five years as the President and the CEO and I also run a lab here. Now I mean another aspect of how do I get into aging research is kind of a mixture of both serendipity and And just you know how life goes I, we ended up

cloning a family of protein goal histone deacetylases, and also a family of proteins that had been shown to be involved in aging. So called sir twins and my lab worked for the last 30 years on epigenetic regulation of transcription. And so it turns out now, epigenetics is one of the major regulators of the aging process. And I hope we'll come back to this later. So that was the serendipity, from the scientific point of view, from a more personal point of view, I watched my my dad, smoking his whole life, and, and eventually, you know, by the time he was in his early 60s, or suffer from the complications of smoking, which, which really showed me, you know, what he and many other people his age we're living through, and that is, you know, people working for through their whole lives and getting to the point that of 60. And being actually chronically ill for until he passed that at 77. And so that really sort of painted for me an image of aging, which was somewhat atrocious, this idea that work your whole life, and you end up spending your retirement years, you know, being sick, or going from hospital to hospital. And my dad is a chronic smoker went through every single complication of smoking, cancer, and bladder cancer, lung cancer, multiple heart attacks, and so on. So I, that really sort of made me want to combine my two interests, which is basic medical research, but also really changing the way we deliver care. And I hope we can spend some time about what I think are the shortfalls of medicine, as we practice it today, and what does the field of aging actually bring to the sealed anyway? So this was a very long winded answer to your first question. I hope that makes a lot of sense.

Jake 07:11
No, yeah, that's great. And it's it's great to hear sort of the professional career path and trajectory combined with the personal story and, you know, family related motivations, it all ties together to make quite a bit of sense. Why don't we start where you sort of ended up there, before we get too deep into Bach and aging, and everything like that, we'll start from like the most macro view possible, just talking about healthcare in general, I think a lot of people sort of fashionable to call it sick care these days, because it's so reactive, and responsive versus proactive and preventative. And I think there's this hope, sort of underlying the longevity and aging research that, you know, at the very least, this can give us a

different perspective on how we handle human health. And maybe it doesn't translate to meaningful health healthspan extension in the immediate future, but at least at least we start to treat things differently. Is this just a narrative? Or are you starting to see certain signs of, you know, various catalysts that we're actually beginning to look at healthcare from a very macro lens, like in a very different way than we have in the past?

Eric Verdin 08:26
I think it is a reality. And the fact that really, our current model of healthcare has shown as limitation in that we are spending more and more, and our lifespan is not increasing in proportion. And I mean, to be honest, with your viewers that are your listeners, we are spending way more than than many other countries and are actually populations is not living longer, it's actually living shorter. So we have somewhat of a deficit when you compare us to many of the countries of the Western world, and even frankly, the non Western world. Some of my colleague reminded me recently that Cuba spends about a 16th of, of our healthcare expenditure. And and despite this, they live about three or four years longer than us and one of the biggest difference between the health care system in Cuba and here is that they invest almost everything into preventative medicine. And and we invest half of our dollars actually of healthcare in the last year of life of people. So that's really paints a very different pictures of everything that we can we could do with our resources. So there are really two aspects to me of our healthcare system that are brilliant in need of revision and challenged to be fine and this is this is a role that I think we relish playing. I am Consider the field of aging as a disruptive force. And, and our goal is nothing but really changing the way we think about medicine and delivering care. So I see two, two biggest problem are one is the fact that medicine today really considers you healthy. Until you have a catastrophic event, for example, you can be considered in good health, maybe not super fit, but in good health and, and die from a heart attack. So the same thing, you can be considered healthy, and have a cancer that will kill you within two or three years. Clearly, we know today from from from our work and the work of many other colleagues that the heart attack or the cancer is the epitome is there sort of the last step of a process that's been taking place for a long time. And so we are very

good at treating the acute events, you know, preventing you from dying from a heart attack or treating your cancer and we see, you know, huge amount of progress in those two areas in the last few years. But we see very little focus on understanding what are what are the processes that actually eventually lead to the heart attack or the cancer? And could we who could we have intervene way earlier to actually prevent those. So that's really one of the focus that we need to change. The end that's essentially preventative medicine. The problem about preventative medicine is, what are you focusing on? What how do you how do you identify those risk factors that are actually going to make you more prone to have cancer or heart attack, we have some evidence. But we also know that aging is the biggest risk factor, not only for cancer, for heart attack, but also for Alzheimer's disease, Parkinson's, macular degeneration, or C, arthritis, osteoporosis, chronic pulmonary disease, renal failure. So there's a whole series of diseases for which aging is really the biggest risk factor. And so what the field is bringing to the table is, if you understand the risk factor, then we can hopefully try to mitigate it. And this is what we are working on. So that's the first aspect, this idea of changing medicine from reactive to proactive. And the second one is, you know, for the past 40 years, we have been, I say we this is the whole field of biomedical research, we have been nothing interested in the pathways that control aging, and the control, essentially every function. And out of out of this has come to an understanding which is now changing the way we think about a human body or human biology. If you think about it, much of medicine and the funding system, the NIH, are based on a an understanding of human biology, which dates back to the 16th century, which is essentially, you know, when people started conducting dissection of human cadavers, and were able to identify the heart and the liver and all the different organs. Medicine basically was based it and it's still today based on organ manifestation. So you go see a cardiologist, when you have a heart attack, you go see a neurologist, and you have Alzheimer's, and the list goes on. What we have learned in the last, you know, 40 years, particularly in the last 20 years, is that every one of these organs actually expresses quite, you know, very sheer number of pathways and molecules that regulate aging in every one of these tissues. Which means that when you, you know, if you have a heart attack today, you can probably go see a physician and he's going to work on the risk factors that would

prevent another heart attack and we're very good at this, we can treat them we can prevent them. However, when we do this, we do not really address the biggest underlying factor, which is your age. And so what the field of aging is doing is by identifying these shared pathway that are present in every single organ, once you target them, you actually are preventing not only the heart attack, but you're preventing neurodegeneration. You're preventing you modulating the rate of aging, which means you are working across the whole system. So not only is this approach preventative, but it's also global. And we see this in animal models and it's when you tinker with the pathways that control aging, you change the rate of aging, and you Change the the the risk factor for all of these diseases together. So this is a concept that actually originated at the back and so called geroscience hypothesis is this idea that aging is a risk factor Trumps all other risk factors and should be the first one that we address. And so what's quite interesting is that this idea is meeting with obviously, with a lot of resistance because it is, you know, challenging a whole series of vested interests, I mean, modern medicine. You know, of course, if you're a cardiologist, you are not interested in the doctor that tells you that the biggest risk factor is not the heart specific factors. But you know, these global things such as aging. And so I think we're quite excited to play this role and of disruptive force. And I think it has enormous potential for the future.

Jake 15:59
Was it challenging for you having gone through like medicine, medical school, and you said, like jumping around institution to institution over the course of your career, it's, like you said, you just mentioned the cardiologists like, it's a fairly traditional medical thinking and science that sort of overwhelms all of those different areas. And yet, you sort of had the clarity to see past it and have this idea that it not that it was like your original idea or anything, but to sort of give credit and an open mind to this idea that we might be able to target aging, as the risk factor, you know, the primary risk factor behind all of these diseases that are sort of aging induced, was that challenging to sort of ignore probably a lot of what you had learned along the way, and consider this concept that still sounds crazy to a lot of people that we might be able to just hack at the root and go after aging directly.

Eric Verdin 16:55
Yeah, I love what you term sort of hacking at the roots, it is really is really what we're trying to do. Now, you know, some people have said, it was a Frankly, I mean, it was a very gradual process. So I do not remember sort of being challenged by it. Because I was always extremely frustrated by, by what I saw as the the short shortcomings of modern medicine, the fact that there was so much suffering, the fact that, you know, if you are a normal person, you can be expected to spend 15% of your life afflicted by one of these chronic diseases of aging. So that always felt like a failure of the medical establishment. So I think, you know, when the geroscience hypothesis emerge, it was more like, wow, this is such an incredibly profound finding. But what was more challenging was the fact that when you discuss this with people, they will say, Well, of course, you get old, you get sick. So we have accepted this as a sort of the normal the norm. And it is, and I've made some analogies to Newton, you know, Newton, and his work on on gravity, he was not the first one to observe that apples fell from trees. Everyone knew that Apple fell from trees. And so the same way as everybody today knows that you get old, you get sick. So the question was that really distinguish Newton was the realization that I'm asking your question, why do Apple fall from trees? And I think, you know, the role that we would love to play without, you know, too much hubris and comparing ourselves to Newton is the, the idea that we want to answer the question, what is it about aging that actually predisposes you to all these conditions? And can we understand aging at a molecular level such that we will actually really be able to slow it down, perhaps reverted, and it actually really suppress these diseases of aging. And so the frustration for me right now is not been coming to this realization. It's been to the resistance that the traditional sort of medical world as given to us, and the fact that when we explain what we're trying to do, there is not I think the excitement in my opinion, is not proportional to the potential of what we are trying to work on.

Jake 19:36
Right. So one of the things we talked about just briefly before starting the recording, was the idea that there's this emerging class of wealthy people being minted, sort of in real time from from crypto,

Bitcoin, Ethereum, and all the rest. And it seems to me you know, this is obviously a major interest of mine and have a lot of people on the podcast from crypto In addition to longevity, and to me, there's a natural overlap there were these younger people who tend to be more open minded, and just frankly, like dream a little bit more that we might be able to live till 200, or something that most people would have said was crazy. You know, most people still say it's crazy today maybe? What do you think I know, you're sort of tangentially paying attention to some of the developments in crypto and excited about the potential of what that space can sort of do, maybe interlocking a little bit intertwining with, with the growth and, you know, study of aging? How do you think that relationship could play out over time and sort of what's what's exciting to you there,

Eric Verdin 20:45
it's, you make a pretty interesting point, you know, when Ie got into the field, I was under the impression that that most people who were in the old days would actually be very interested in what we're doing. And if this turns out not to be the case, it turns out that the people who appear to be the most excited about what we're doing, are people who share sort of a philosophy of life, that that we have, and that's the you know, and one of these communities is the crypto the crypto world. And I am, you know, just, I guess, perhaps by nature and passion by disruptive forces, in nature and society. And I think my impression is without, you know, talking about a domain that I do not know extremely well is that the philosophy and the approaches of the crypto world in the aging world, aging research world are very congruent and convergent, I think we are both quite new fields. You know, aging fields, aging research, the way we think about and the way we are practicing, it is really a field that's mostly 20 to 25 years old. So it's relatively new crypto world is probably about 10 to 15 years old. We are both very disruptive forces in the way that our ambition is really to change the world, and to make the world a better place. And I find it actually incredibly enlightening and inspiring for me to be working alone, you know, Asian people in the Asian field, you know, the people who actually do the work, and become more of a spokesman, even though I still have a lab, I give all the credit to the postdocs and the students who are doing the work. And the labs. I mean, they're all in their 20s. And they are passion, by by their

work. They're incredibly enthusiastic by their ability to change the world. And I see this, I see when, you know, perusing Twitter, you know, talking to people who are in the crypto world, I feel exactly the same energy. And a friend, you know, quipped the expression that everybody young wants to be rich, and everybody rich wants to be young. And I think there are many, many sort of conversion interests between these two fields. And I, I'm really excited by the potential. Yeah, I mean, working together to basically go to where we want to grow, basically, which is to, you know, healthier and longer live.

Jake 23:36
Yeah, I'm hopeful that, that these things won't just sort of be progressing along and in silos, but that there will be some overlap along the way. I know vitalik, who created a theorems already made some pretty substantial donations in the aging space. And there's just a lot of people even going back to the very original days, one of the, I think the first guy to do a transaction with the Creator, a Bitcoin guy named Hal Finney was super into, like cryo, and Roger bear was also into that he was one of the early people promoting Bitcoin. And he was on an earlier episode of the podcast, talk to them a bit about that. But there's just a sort of surprising amount of overlap, but I couldn't really think of two very different and seemingly totally unrelated fields that seemed to have sort of shared interests between a lot of people involved. Hopefully, it continues to develop in that direction. And I'll certainly be doing my part what little I can to keep the two related and growing together to the extent that I can. I think from like a very fundamental perspective, it would be good to hear, given that you're running the book, how it fits into the overall sort of aging field right now and maybe historically or in the future. There's obviously Like drug discovery and clinical trials and bringing these things to whether they're drugs or supplements or products, there's there's a lot of different sort of stages of the science here. And it'd be great to know like, how you know, where the buck fits into all of this, and how it helps be the space forward. And maybe we could talk a little bit about what you specifically are most focused on.

Eric Verdin 25:25
Yeah, cool. Yeah, that's actually a great question. So maybe, let me just tell you a little bit how we, we came to be, because I think it

really speaks to, to some direction to where we are today. So we started in 1999, with a gift from barrel back with a nurse and whose husband, Mr. Back actually had a small amount of money not not so small at the time was $10 million, which eventually grew to a very large endowment. And they wanted to enter in a testament, she said that she was leaving her personal fortune to, to create to improve the life of the agent, and which was remarkably a preset, sort of a pre mandatory type of vision. At the time, people were not talking about aging research. And so so again, you know, the back to be so we were funded with an endowment from the, from the back family, which today contributes about five to 7% of our budget, which is, you know, not not the whole budget Far from it, but the small part of it and, and her memory. And so what we have been doing for the past 20 years is essentially building a deeper understanding of the aging process. And about 20 years ago, as I mentioned, the first papers were emerging, suggesting that aging could be a process like any other process biologically that you could modulate with, with small molecule with jokes. And actually, the first drug to be shown to increase lifespan was reported by one of my colleagues, he had gotten difficult. And so this really opened up the whole field of thinking, well, maybe one day we will, we will be able to modulate aging. And so much of our work until five years ago, was focused on really mapping aging pathways, identifying percent possible drug targets, what was initially the exception, the first identification of a of a dragon protein that could be regulating aging, just became actually quite easy to find today, we have more than 600 different drug targets in for example, in C. elegans, a little one that we work on, that can actually regulate aging. So just going from an exception, we've we've actually shown that it is not that difficult to regulate lifespan. And so So did you know, much work conducted in Drosophila and fruit flies in mice and so on. So we've, we have gained an incomplete but certainly much better understanding of the aging process and what we had 20 years ago, I came to the back five years ago, I was at UCSF, for for 20 years before this writing lab at the Gladstone Institute. And one of the reasons I think I was recruited to run the back is the fact that having a medical degree and an understanding of what it takes to you know, to move research from model systems into humans, I think we've been embarked on that on a mission to really change medicine. And obviously, we are at the very beginning of what's going to be a long

process. And but an important one, and that is, you know, you can, we can do a great job making mice live longer making worms live longer, we can do amazing things in terms of our ability to regulate aging pathways. But it's it's, you know, it's only going to become pretty significant to all of us, the day we can implement these, these discoveries to humans. I mean, so the good news is we are five years later we've embarked and you know, broadening our mission, recruiting MD PhDs, recruiting people who are interested in doing human biology, starting clinical trials. So everything is moving in the right direction that the thing that gives me pause is the fact that I want everyone to understand that this is much harder as soon as you're going to humans that are, you know, a whole series of issues lead to safety and make them too efficacy that need to be need to be addressed. And so we are ready for the long haul, which is really the vision that we have is to build a back institute that will be the new world center for all things related to aging. Just a few statistics today, we have 300 employees, about 22, faculty members, each of these faculty member as a group between 10 and 15. People, everyone is working on AG, we all work on different aspects of the aging process. And based on the assumption that no one really has all the answers, and we're sort of hedging our bets by pursuing many different approaches that we think would be important in our effort to, to defeat aging. So it is a really exciting time. And I think one that I predict will lead to, you know, some of the first anti aging medicine for humans within the next five to 10 years.

Jake 31:02
Right. So let me Well, I sort of had one question I was gonna ask based on what you're saying, and then that last question makes me want to ask now there are that last point rather. So I'll try to ask you, and hopefully you can touch a bit on both. The one that just came up the end is you said, you know, you're hoping that we'll see some real progress in that the next five or 10 years, some early signs of some big breakthroughs, be curious to know what you think is sort of most eligible to be that first or second breakthrough from from where we are today? And then secondarily, maybe you can just answer that first. But the second thing I was wondering was, you know, you mentioned how all of this takes time, and we're very early. And I totally understand that. I wonder how much of it is sort of slowed or impeded by

regulatory sort of, you know, traditional regulations and long standing, maybe risk averse rules that we have in place where in a perfect world, I'm wondering if there's anything that you might change to potentially, you know, open the door for accelerating some of these interesting technologies that we're working on today?

Eric Verdin 32:16
Well, it's a big question. How much how much time you have?

Jake 32:22
We got about 18 left on the on the scheduled blocked, but if you want to go over, I'm all yours?

Eric Verdin 32:27
Yeah. So I know, first question, I'll adjust is the the whole issues of what are the What do I think this field is going in terms of translation in the next few years? Is that is that a good way to rephrase what

Jake 32:45
you said? Yeah.

Eric Verdin 32:46
So I think I suspect, you know, your audience is, is probably interested in the field of aging. So they've heard they've heard about many of the targets that I will be discussing briefly. One thing that I would like for your listeners to to realize is that one of the biggest limitations that we have right now is not, it's not a dearth of ideas and potential therapies, it's the fact that we don't have the funding to go after all of them at once. And so people are essentially trying to hedge their bets and try to see to go after the ones that seem to be the most promising. However, as we know, you know, getting medicine approved for humans is a long and arduous process. And so we have to be proceeding cautiously. So, so there is I mean, clearly a need for more funding for, for people to jump on this adventure and help us to really explore not one target but multiple targets. That being said, if you think if you look at the field, there are a number of these targets that are ready in humans and some of them are tested. Humans, I will think about, you know, a drug like Metformin, which is

an anti diabetic drugs. This is not a nice it has been shown to increase lifespan It is very promising. But again, here we also need to do clinical careful clinical trials. Now, when I speak about clinical trials, this will touch upon the whole issue of regulatory that you mentioned, the difficulty of testing drugs in the Asian space. Obviously, you nobody can afford to do a 34 year clinical trial to see you know, who dies when. So the field is, is taking a number of approaches that are going to be quite interesting in terms of how to address this. One way is to target a specific disease of aging and see if you can modulate it. Another way is to To actually, essentially identify novel biomarkers that that correlate with aging. And this is a big field of research right now really trying imagine the field of heart attacks and settings. without the ability to measure cholesterol, we know that once we were able to measure cholesterol levels and to determine that they represented a significant risk factor for heart disease, this created a whole industry $20 billion a year starting industry, that actually now mitigates the risk of a heart attack. So imagine, when we will have a validated biomarker of aging, I think we could be good Really, this would be one of the tools that will drive the revolution that we think is before us. So I mentioned sort of Metformin, rapamycin whole field that is very exciting for us yet the back also, is the whole idea of senescence and sinner lipstick. So these are drugs that selectively kill senescence cells, we know that they accumulate during aging, we know they play an important role in the number of chronic diseases of aging. Judy kpz, was a faculty member at the back has been a pioneer and defining the whole senescence field. And, and so including the founding of unity, a company that generated the first senolytics. And so these are clinical trials. And we hope that you know, within the next few years, hopefully one of those will, will be efficient that combating one of these chronic diseases of aging. But there are many other areas. So many other areas in the field have speak briefly about epigenetic reprogramming, which is a field very dear to me, having worked on epigenetics for the last 30 years, and having identified including many of the genes that actually are epigenetic regulators, I can definitely tell the enormous potential that this has, this is, by the way, one of the first interventions that has been shown to to lead to a reversal of the aging process, it's still modest results, but there really carry a potential for for big things in the future. And so

epigenetic reprogramming is certainly one of the the most exciting area in the aging research right now. But others are speak of, you probably have heard about heterochronic parabiosis, this is the idea that you can, that there are factors circulating in the blood, that might be contributing to aging. And so you know, two different approaches there. One is to identify these factors that are present in young people and give them to older individuals hoping to rejuvenate them. The other approach is to actually try to dilute the bad factors that accumulate during the aging. And so both approaches are being explored, and I think could also yield interesting drugs in the future. So that would be you know, sort of a very broad survey, I'm sure, I'm going to insult some colleagues, because I haven't mentioned the area that they're working on, you know, autophagy regulation is another big area. And fasting, and the list goes on, there are so many, and not to say anything about exercise, or, you know, mimicking exercise with medicine. All of these are areas that are being explored in the field. from a regulatory standpoint, I tend to be a bit on the conservative point of view, because I think, having seen you know, over the years, the number of drugs that actually have hurt people, really inspires some degree of caution, I think we have to be willing to take chances. But we also have to be careful and cognizant of the fact that whenever you give a drug to someone, you have a potential to improve them, but he also had the potential to hurt them. And I have argued that, you know, the field of research is so young, it cannot afford or we can even afford, for some really bad story to do to emerge in the literature that we've actually heard some young people and, and kind of decrease their lifespan by 10 to 20 years. And you know, one reason I'm saying this is that if you think about a drug that's going to be used in younger individual with the hope of increasing lifespan, we're speaking potentially of interventions that are going to last a lifespan. And so one way to maybe mitigate this is to think that start this and people who are you know, later in life might already be suffering for some of the manifestations of aging. And let's see if we can actually see an effect there. So There are multiple ways in which the field is grappling with Are we going to be deploying these drugs that have the potential to fight aging? On the other hand, I think you know, we many of us are, I call ourselves free agents. And, for example, the fact that people are taking Metformin now is a good reflection of this. The same thing can be said for a

whole group of middle aged or younger people who are also taking rapamycin. I would say, as long as people understand what the risks are, and what the limitations, that is totally fine. But at the end of the day, the only way that these therapies will become not only deployed but also be embarrassed and broadly available, is through the rigor of clinical trials or placebo clinic or placebo controlled clinical trial, which is the only way you can actually really determine whether something works or not. And I think, as a field, I would argue that we should be adventurous, but we should also submit ourselves to the most rigorous ways of demonstrating the efficacy of what we're doing. And there are, you know, a number of things that are circulating around in the field that are making promises. And I would invite all of your listeners to you know, to watch all of this with a suspicious, not not suspicious, but a questioning I because until it is proven, it is now proven, and which means that we have a lot of work to do, and we will do the work. One thing to realize also is the way biology is accelerating, I think gives me hope that what we consider as limitations today, for example, this idea of having to do a 10 year clinical trial to demonstrate the efficacy of one of our drugs, these these barriers are going to be falling, we will identify better biomarkers. And hopefully within two or three years, we will be able to predict with a reasonable degree of certainty whether a drug is going to work or not. And I think this is, for me, the whole field of biomarkers of aging is a huge area of potential to it's not only the potential, but it's also the break right now that slows down the field, really to allow us to accelerate what we're doing and translate all these discoveries for humans.

Jake 42:33
Yeah, I think the discovery and development of accurate and reliable biomarkers has always struck me as something that would be a huge catalyst to just accelerate progress. Given that you know, an aging study, you typically have to wait to watch people age, but if you could sign of kind of find a biomarker, similar similarly, like how you mentioned earlier with like, cholesterol and things like this, then it might just allow people to do shorter time intervals on on clinical trials and things like this, and hopefully help to accelerate progress in the space. Last question for you. I know, I'd heard on a previous podcast, you talked about how some of these technologies that

are available, and frankly, pretty easy and quick from my understanding to use today such as like CRISPR, and cast nine things like this. You'd said that earlier in your career, if someone had told you that these things would be available and practicable and as easy as they are today and is commonplace, you basically wouldn't believe them. And I know you're relatively conservative guy working in a very ambitious space. So it's sort of like an oxymoron in a sense, but I think it's like the right level of conservatism. So I'd love to hear given sort of who you are and, and the space that you're in. What's it like the edge of your imagination today for what we could see like within your lifetime, or call it you know, in the next 20 to 50 years, whatever sort of timeline you want to put on it? I'm not suggesting that that's, that's your lifetime, but just in the next like, reasonable, few decades? What's like sitting at the edge of your imagination, it's obviously a fair question to ask you. You know what unbelievable thing lies ahead? Because sort of by nature, you wouldn't believe it, but I'm curious to hear some of sort of the edge cases from a conservative person such as yourself. Yeah.

Eric Verdin 44:30
Well, first, I would not call myself conservative. I really I if you if you knew me, and you will probably call me anything but conservative. I want to change the world I think is really the thing that gets me up every morning. And I'm really willing to disrupt really, I mean, being an MD and taking the stance is, is not conservative. It is actually highly disruptive. However, I also want to be a realist. Yeah. And I think you know, there is, there is a need of, there's a need in every field for someone to just project extremely far and to see what could be. There is also a need for a voice of realism. It is hard to develop drugs, it takes long time is expensive. And we want to do it well, to me, that's really the most important thing we want to do. We want to do good. The goal here for me is not to, you know, to create a drug that's, that's, that's going to make a lot of money, but not really change people's lives. And so I my approach in everything, and I think this is an approach that I've argued our field should take is to, we're in this for the long haul. And so my approach is to under promise and over deliver, hopefully, and I suspect that this is exactly what will happen from our standpoint. So we I'm very reluctant, for example, to talk about how

many years are we going to live? And I, you know, I get invited on post podcast, and it's either 121 50 or 200. And, you know, my, my answer to these numbers is, there is no one today, not me, not David Sinclair, not not anybody, you actually can predict how long we're going to be living in the future. What I can tell you is, biology is moving at a rate that really suggests that we, we will accelerate the process of increasing our lifespan, and possibly even within my own lifespan, you know, there's someone recently told me that the human brain is as when you look about exponential processes tends to overestimate the short term effects of exponential processes, and underestimate the long term effect of these exponential processes. Now, one big question is, for example, is his research on aging, already an exponential process, I would say that biology in general is undergoing an acceleration, the likes of which I, you know, haven't been in the field for close to 35 years, I have never seen before, and the acceleration of our understanding the acceleration, and the complexity of the new tools, bringing in AI and Bioinformatics, we are generating so much data and so much more understanding than than what we used to do it. It's it's, it's absolutely exhilarating of excitement. And so, you know, I think a number of people are tend to overestimate how quickly this is going to translate into humans. But again, I suspect that we are all under estimating the dramatic effect it's going to have you know, 2030 4050 or 100 years from now and so I'm I'm totally bullish on what we're going to be able to accomplish. And you know, it's again, you know, in the last sentence is, I think it was Niels Bohr, a famous physicist who we said it's very hard to make predictions especially about the future and I think this is probably where I stand right now i think i know i'm i'm going to be busy for a lifetime continuing to work on this incredibly exciting biology pushing this as hard as we can into humans and and hopefully we'll have some students and victories along the way but I think the future is just incredibly bright for all of us.

Jake 48:58
That's awesome i love that answer. I hope you're working on these things for a very long lifetime and and I'm excited to follow along as you go wrapping up here we're up on time but where can people go and you know follow along all of this progress and maybe you know, where can they go to donate to buck if they want to and, and things like

this and you know before we end with that, just want to thank you again Erica is awesome talking with you and really love and you know, admire what you guys are doing and we'll be rooting for you for as long as I'm alive. Hopefully you guys help that to be a very long time.

Eric Verdin 49:36
Thank you so much and come to visit when you have a chance. I think in terms of places where you can follow us we are back institute.org is our website. I think we've tried to build it to appeal both to to the general public, but also to what I call highly educated amateurs or people who are scientists. So hopefully everyone will We'll find something of interest there the website. We also reopening for business we have and hopefully in the near future we will have more. If you live in the Bay Area, we will have more seminars and some of them on zoom in Finally, I try to be a little bit active on Twitter and you can follow me on at Eric Verdun and with a c, v r di n and, and if you're interested in helping us out, just send me a message. I mean, again, if Verdun at buck institute.org and thank you for the opportunity and I think I look forward to staying in touch