Introduction to Aging and Function

And function can be anything, right? Is that we could look at liver function, you could look at lung function. But when we had actually done some focus work, and this is the royal we, so this is some of my colleagues at Wing Forest, when they did some really good focus work with groups, is that when we talk to older adults, middle-aged and older, about what do they want?

is that when they're thinking about function is that they want to be able to engage. They're interested in their cognitive function, so be able to keep their memory intact, be able to remember a grocery list.

They want to have the mental capacity to be able to interact with their grandchildren and their community. This is Doctor Talks, real talk from real doctors on the issues that matter to you most.

Hi, everyone, and welcome to the show. I'm your host, Dr. Melissa Grill-Peterson, and I am so excited with the guest that you are about to hear from. You all are going to love this.

I am joined by Dr. Jamie Justice. She's a leading neuroscientist dedicated to translating aging research into clinical interventions. as the executive vice president of health went the XPRIZE.

Yes, you heard it right, the XPRIZE Foundation. We're going to get into that. She spearheads initiatives to develop innovative solutions aimed at extending health span.

Dr. Justice also serves as an adjunct professor in the internal medicine section at gerontology and geriatric medicine. at Wake Forest University School of Medicine.

Her work focuses on evaluating the functional role of biological processes underlying human aging, that's important, we're gonna talk about that too, and advancing interventions targeting these processes into clinical trials, and most importantly for us, ultimately so they can turn into practical application.

Dr. Jamie, thank you so much for being here. It's an honor. My pleasure, thanks for having me. Let's kind of jump in with the time that we have Then talk about first your work.

So it's really kind of rooted in basic biology, and I love that.

Dr. Jamie Justice's Research Background

I say, hey, if we understand the cell, we understand the system. And so how has your foundational work in looking at aging processes, what has it shown you that can be applied to truly extending healthspan?

Right. So my work as a scientist was really, yes, looking at the cells, but I was really interested in designing frameworks for how we test therapeutics.

And so I ended up being fairly solution agnostic, which was great. It actually set me up really well for what I'm doing now. But that meant looking at how we can think about therapeutics, whether we're looking at nutraceuticals, supplements, lifestyle interventions, or even drug targets.

and take those from animal models into early stage clinical trials. And so most of my work was really sort of at that junction. So in my early doctoral work, just after I got my PhD and was doing my work, is that I would often be in the clinic in the morning and then testing the same intervention or therapeutic in mice in the afternoon.

Is that there are questions, you know, people are not big mice and mice are not small people, but there are certain

insights we can get from one or the other, certainly doing lifespan studies in humans really hard, but we can really look at function.

And so in both of those, we tried to pair the functional assessments in each model and that we would try to apply that model and test different interventions to try to see which ones either work alone or in combination to really improve function across multiple categories.

I'm really interested in physical function, cognitive function, and things that are not quite disease, but really very important to maintaining independence and quality of life as we age.

And so followed that foundation into work at Wake Forest University, which I had incredible colleagues and mentors there and really got thrown into doing a lot of network work.

And so this is again, right at this time where we knew and we're starting to get real evidence that the biology of aging could be targeted not by one, but by multiple pathways.

And that might be a very practical and feasible approach to address humans with aging. And so, it has applications to human disease. But really, my primary interest is if you've got a therapeutic.

It could change human aging, how would you know? And so I had the great opportunity to work with some really large national and international groups to start setting up those frameworks.

And so we did some of the earliest testing of phenolytic compound to satinib and carcinin. So that was my study. I did the first in humans, which was great, with Jim Kirkland's group and our work at Wake Forest.

We tested it in idiopathic pulmonary fibrosis. At the same time, I also spent those years not just really thinking about senescence and senolytics, but also had the great privilege of working with, again, my mentor, Steve Chefsky, and that was our group.

We also worked with near Barcelli, and we were doing all of the development for something called the Tang trial. Yes, targeting aging with metformin. So I went from being the sort of the grunt labor on writing applications and doing a lot of the analysis and work to being on the executive committee for that journal.

So it's been about eight to 10 years sort of working sort of at the face of what would the regulatory landscape be. So if, as a clinician, you had a therapeutic or a drug, How would you administer it?

What would it look like? How would it be regulated? And so these were really big fundamental questions. And so my work has still been all around that.

So it is looking at cells. And in between, yes, I did run an actual wet lab. So a lot of my work is in biomarkers. I ran a biobank. In any of the clinical trials that came in, as we tested a lot of different agents, we also did work with time-restricted eating, intermittent fasting, exercise protocols, others, is that really, again, thinking about If you had somebody that came to your clinic who was older, maybe frail, you know, their physical function wasn't quite up to what it would be, would you just prescribe the metformin or would you think about things that would actually try to improve their function, maybe even combine it with things that would be, you know, you want to have a large quiver in order to treat and really think about the person.

And so we tried to energy set in a lot of her work. 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.

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Measuring Healthspan with Function and Biomarkers

RadFest 2025. Take advantage of lower advanced pricing now at radfest.com. And which is just beautiful hearing the approach. And I really appreciate how it would be in the clinic in the morning and then testing in the afternoon.

How you've been both kind of in the trenches, but also then at the level of informing really just when I say policy, I'm meaning around the research, right?

That's what we're looking at. And how do we need to be thinking about this? And you said something really important. how do we actually know if it works?

So if we have an end target of a disease and a specific molecule, we can say yes, no. But when we're kind of taking it from a proactive approach and saying, functionality, what moves the needle that happens before a disease stays?

That's right. And how is that measurable? So, what did you find in exploring that? Are the best ways to assess what type of indicators, what type of biomarkers are giving us the clearest early as you're moving in the right direction?

Or, whoop, pump the brakes, let's back up. Great. Thinking about this in terms of both research and as a provider, which I'm not, you are, love it. So it's really, it's us having a conversation together and really thinking about the patient.

And so when it comes to doing any intervention, even if it's something as simple as, you know, changing lifestyle or behavior or a diet or sleep patterns, Anything that you do has, there's a risk and a benefit for changing behavior.

So it's really looking and sort of balancing those things. And so when we think about interventions, is that yes, a biomarker is great. We'll eventually get there.

Before we can get to the biomarker, we have to show that the benefit outweighs the risk of the change. And so when we think about benefit, the way our regulators talk about it, and I actually think this is great, it's a great framework, is that if you want to change and show that the benefit of doing something is better than not, and it outweighs the risk, is you have to change the way someone functions, feels, or survives.

And so I think that gives us a really good framework for does it work, and sort of what that means. And so when we're thinking about aging, if it's not a disease or we're not looking at survival per se, like I said, humans live a long time.

So doing something that we're going to change sort of the risk of mortality and in general age, it's… But we don't have decades for that. And so looking for something that's really in the short term, that puts us back into that function field paradigm.

And so for us, function is a great place to start and probe it. You can test it. You can do it. And function can be anything, right? We could look at liver function.

You could look at lung function. But when we had actually done some focus work, and this is the royal we, so this is some of my colleagues at Wing Forest, when they did some really good focus work with groups, was that when we talk to older adults, middle-aged and older, about what do they want?

is that when they're thinking about function is that they want to be able to engage. They're interested in their cognitive function, so be able to keep their memory intact, be able to remember a grocery list.

They want to have the mental capacity to be able to interact with their grandchildren and their community. And they want to have the physical function in order to meet the demands of their day.

And so, you know, to be able to maintain sport or to be able to walk, to be able to cross the street in time to make it through the crosswalk, that's a real feeder.

And so, you know, have the basic function to walk up and down stairs and to do those things. And so, I mean, that becomes a really important goal. And that that's a really good thing that we can frame around.

It becomes a great endpoint for trials, is how do you maintain that intrinsic capacity to be able to live into your life? And then the next thing around that is also, we all just made it through a pandemic, and that we realized that, yes, you can have all the mental and cognitive function, but if you don't have an immune system resilient enough to leave your house and be able to interact, is that that's a really crucial component for how we need to live our lives.

And so that ended up being really informative to those trials that I did as an academic and has also been really important in the transition for how we're encouraging our teams to think about what the goals for these trials would be and that those would also be supported by the seals.

So you're reporting how you're feeling and, you know, again, You can start any intervention, but if it doesn't feel meaningful to the person, they're not going to continue it.

Adherence becomes a problem. Correct. And so trying to find clever ways to balance those and that those become really important endpoints. You can put them into trials.

We can do a lot of work. They translate really well to the clinic, but it's not to say that biomarkers aren't important. Right. I love the biomarker work.

So we also have to show that we're targeting the mechanisms we say and that we need an earlier indication. So instead of just waiting to see if somebody's physical performance change or changes, we're waiting to see if there's a change in disease or mortality is to find some molecular or biologic signature.

And we often think about it as biologic or molecular, but it could also be digital. There's a number of different ways that we can incorporate biomarkers.

I think there's an indication about whether an intervention is working or if the time is right to even start to intervene. So, I mean, it's not that there's one answer, it's that there's a system of answers that we have to start by thinking about the person, correct?

And then we design back from that to make sure that we have holistic trials that are actually going to get us further to something that's going to be ready for clinic and ready to improve health.

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 humanlongevityinstitute.com to enroll and become a practitioner today. And I think that as there is this quest, especially in the longevity space, to look at biomarkers and advanced biomarkers, we forget that there's some very basic ones like looking at heart rate, looking at heart rate variability, you know, just some respiratory rate that tells us a lot about function of the system.

And that can also correlate with how are they feeling. Absolutely. We typically see a higher heart rate and a lower HRV when we're not feeling good. Absolutely.

Meanwhile, not recovering. So I think that there are some simple things that can also give some objective evidence

with the subjective kind of in those buckets.

So I love the simplicity of that. That's actually, thank you for sharing that because I think it's something that both practitioners and just people, we are all the consumer health as well.

So I think whether we're sitting in the role of consumer or clinician, that gives us a really beautiful framework just to kind of self-assess, say, bright track, less or more.

That's right. And it can vary by person and by time. I mean, this is really, it's important for us. I love whether biomarkers or functional performance assessments, all of those, you give feedback on where I am.

Like, you know, it's like my body, I'm my biggest mystery. And I love checking in with it. As we all should. And so you take us from the simplicity and you know, one of the topics this weekend has been about health span, lifespan, aging, all these is complex.

And, of course, we are a complex human system, yet there's simple, right? There's simple connection points. And so the same way you have something simple in how you assess if something is working or not, so to speak, let's go into XPRIZE.

XPRIZE Healthspan Competition Overview

Let's take a moment, share about for those who maybe don't know it, although I'm sure everybody does, just give us a quick little understanding of the XPRIZE Health Foundation.

Fantastic. Yeah, so XPRIZE Foundation, we're a global leader in large-scale petitions. So these are incentivized competitions where we actually put prize purse out at the point of demonstration.

When we do this to create impact, and so XPRIZE has been around for 30 years. And in those 30 years, they've launched 30 prizes, everything from space to rainforest to carbon removal.

And I happen to be in a very privileged place of leading the XPRIZE health span. And so this is a $101 million global competition that we are incentivizing anyone in the world to create and demonstrate the therapeutic, can improve muscle, cognitive and immune function.

And that these have to be demonstrated in people, so in clinical trials of one year, and that the change that we're requiring our teams to show is that they have to show that it's not just slowing down the rate of decline.

They have to show that they're improving those by enough that would offset what you would expect to see declines over 10, 15, or 20 years. And so, again, this is a bit of a paradigm shift to the way we usually think about prevention trials or we think about aging as we all talk about decline, decline, decline.

We're actually saying that, no, I think that we have an opportunity to actually show improvement and that that's one of the fundamental criteria. But when it comes to our teams, again, I came at this from a scientist and an academic where usually you have funding and you do these program models and do this.

Competition models are completely different. We don't tell anyone what to do. We just put the guideline out there and say, this is the criteria you have to meet.

Do it safely, do it intelligently, but really crowdsourcing innovation. We have now, we launched a year ago, we just finished our primary registration period and the response.

has been overwhelming. And so it's wonderful. You know, in leaving my lab and taking this on, I really didn't know if it would work. It was so new to me.

I didn't know people would show up. We're asking so much of our teams to go after this. And it's been, I just

absolutely smashed any of my goals or anything that I thought had happened.

So we, again, just closed in January of 2025. not closed. We closed that stage. We're still open for late registration. So if somebody has a great idea, still bring it to us.

It's still happening. But at least for our milestone one judging where we're going to name our top 40 teams in May, that round has closed. And so I've read every application that came in.

And so again, out of our teams, we ended up with 602 teams that registered. Not all of those, you know, are continuing on. Some of them registered. They're really excited about it.

They show us where the movements field is globally. 602 teams, 58 countries across six continents. I mean, it is global. So it really shows that there's a lot of appetite for this field.

Amazing. And, you know, out of those, we have a range of different teams with lots of different applications. From that, there's already a bit of a down select.

how many teams were able to put in a clinical submission. So this was like a 12-page submission that they had to show us who their team was, if they're doing testing at a clinical center, what the clinical center of their environment looks like.

They had a five-page portion of that. They had to really talk about their approach. So, again, it could be a single drug, it could be a biologic, it could be a lifestyle intervention, or any combination.

We had a lot of multimodal clinics coming in, which was really fascinating to see, and that they have to really detail what their evidence is today and how they're going to approach this.

And so now those applications, we ended up with 226 unique applications across, again, HealthSpan prize is the big one, that's 101 million. We also had a $10 million bonus prize around a genetic condition.

So 190 were HealthSpan, the remaining ones were the bonus prize. I read every application. I've gone through every page. Wow. And now those are out for our judges.

So our judges are reviewing them. They're going to name the top 40. This top 40 will be announced in May. We'll have an investor summit. So again, running trials is expensive.

We do some milestone along the way. Small awards, $10 million will be this May, another $10 million in 2026. But the bigger thing we're trying to do is trying to encourage partnerships and funding and investment in the space.

And so we'll have an investor summit wearing our teams with potential funders or people that are interested. And the team breakdowns, it's incredible.

It's incredible. So we have small biotech startups. We have some pharma companies. We have university teams. We have a number of clinics that maybe you're already in practice.

You have something you want to have a way to demonstrate it on a global level or to show that your approach works. And it's just, it's been a remarkable response.

Okay. Well, which is so exciting to just realize, like you said, the appetite that's out there. It is just showing the fact that more and more people of every age, of every country, of every demographic understands that healthspan matters.

And when we are able to express health for longer and longer, we are going to show up to life greater and greater. That's more aliveness, more innovation, more connection.

And I call it dreaming a bigger dream. What becomes possible for humanity when we have that happening at scale? So the fact that the foundation has received that level of enthusiasm and just you know, all going in.

It's exciting. It is. And so, I mean, we're just at the start of this. We're at year one of seventh. And so, it is thrilling to see the response and know that we have more teams coming in.

So, even since that deadline, we've had a handful of others reach out and they want to get involved. And that even if people don't have a team, we have other people that are reaching out that want to be involved in other ways.

And there's so many ways. Some people want to be involved. They say, OK, great. When these go to trial, I want to be a research participant. I love it.

And that will help matchmake as needed. Other people come in and they say, well, I don't really have an intervention, but I've been developing biomarkers.

Do you have a plan for that? and, you know, encouraging people to come and get involved that way. We've even had residential programs last to get engaged who said, well, we have, you know, retirement communities or groups around us that are just looking for a way to get involved.

And there's so many opportunities for people to be part of this. So that for me is what is most exciting. You have everything from high school students wanting to get engaged to, you know, again, large groups really wanting to reach in and support.

Themes, Impact, and Personal Longevity Vision

Well, I could spend hours talking with you. I know only get a few more moments. And what I want to close the mental loop when I was making the point of just the simplicity of kind of that function, feeling and survival.

As you've now personally looked at all these applications, I don't know to what extent you can divulge any insights, but are you seeing some simple distance, so simplicity in the complexity, some themes that continue to arise that again are showing you like this is what we are hearing and seeing as urgency and importance from the field?

Right. So I really have, I think, you know, one part is just, is the breadth of applications has been really great, but there are starting to be some common themes.

And again, we can break those down into some people are doing really targeted therapies and others have these like very multimodal approaches. And what I can't wait to see is actually starting to see even more pairing across though.

Yes. Is that I think one of the things, one of the great places for innovation probably isn't going to be which drug or therapeutic or biologic, but it's going to be figuring out which biologic at what time and which person.

And so, you know, having some of these insights that clinics can bring about how do you personalize and how do you pair that with appropriate biomarker or platforms and then have that really start communicating with people who are doing the development.

And so that's where I think magic is going to happen. And so that's the space that I'm looking at most critically, is that there are some, again, beautiful biology, really incredible developments, especially in the biologics and drug space.

And then I think pairing those with that right approach, right person, right time. So it's a seven-year project. So let's go out 10 years. Let's go out 10 years from now.

Your role in this, what do you hope that the XPRIZE HealthSpan project will do for humanity, the impact that it could have. So again, I didn't get into this business to give away money.

It's a perk. It is a perk. It is wonderful. But I went into this to make an impact. And it's to make an impact in a way that I tried to, and we really were in my world as an academic, but this is on a very different scale.

And so when I think about the impact that this prize will make is one, and you've said it, you articulated it beautifully, is proof of concept. And it's a proof of concept that yes, aging is a target for development, but it's also this element of hope is that aging isn't gloom and doom, it's all not down hell, is that there are approaches and things that we can do to improve our health as we age.

and that I want to be at the center and the cornerstone of really creating a hopeful and abundant future as we age. And so that for me is probably the biggest, most pivotal piece.

Outside of that, we have an opportunity to develop new methods and we're actively doing that. We have a way to vet therapeutics, which is the mechanics of the prize, but also biomarkers and how we monitor them.

And so that's really method development. The next thing that we're doing that for me is the big impact. Where are we going? And it's creating that global research network or clinic network.

How do we pair people across the world that have the right ideas and do this as a collaboration, not competition that's putting people against each other, but putting them together for the greater good?

And then the final really big piece is, again, while we're building that network is to also build it with a foundation of support. And so that includes investment, funding, and building those really strengthened networks so that we can get a lot more done and leverage the strength that we're getting and leverage the momentum of our teams to create regulatory change, funding change, and an investment in our future.

So last question, and we'll wrap this up. So it's a personal question. What is your personal longevity vision for yourself? How long, how well, in what ways, or whatever it means to you, your personal?

Oh, I love this one. So, you know, My vision has not always been for I'm going to live to 200 or anything like that. I don't have a number in my head.

What I have is a function in my head. I'm an avid runner. I've been a marathon runner and a 50 kilometer trail racer for a long time. And I've been really active in mountain sports.

Love them. And so every year on my birthday, I try to run my age. in miles. Love that. And so I want to keep that going as long as I can. So my vision for me is I don't know that I want to be in my, I don't know that I want to be running 85 miles on my 85th birthday, but boy would I love to still run and be able to run a marathon on trail and get out and be functional, be able to engage and be able to do that and enjoy it.

And that, you know, I think that that level of function and commitment to health is something that for me keeps me up. and keeps me working towards this common goal.

One of the common features that centenarians have is they're always looking forward. They're looking forward to what awaits them. It's like they live for today, they live for tomorrow, but they're not afraid to die today is kind of the saying they go by.

And so having that vision, you already have something of running and maybe you won't actually want to run on your 85th You know that that is something that's just giving you such forward thinking and so you'll be doing that and even greater and I will be excited to know all about that.

Fantastic. Thank you for being here with us. My pleasure. Thank you so much. This was great. I loved it. Oh my goodness. Fantastic, right? So great. So listen everyone, thank you again for tuning in.

Until next time, continue to be bold, stay curious and go out and express your greatest states of aliveness. Take care. Thank you for tuning in to Doctor Talks.

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