Avery Martin: Welcome to Health and Human Science Matters, a podcast by Colorado State University's College of Health and Human Sciences. I'm Avery Martin, co-host and digital media strategist.

Matt Hickey: And I'm Matt Hickey, associate Dean for Research and Graduate Studies. In our college, we make it our mission to optimize human health and wellbeing through discovery and innovation. But don't just take our word for it. Each episode we sit down with people who fulfill that mission, our college faculty and staff. And today we're lucky enough to have a dear friend and colleague from my home department, Karyn Hamilton. Karyn, welcome.

Karyn Hamilton: Thank you. Thanks for the invitation.

Matt Hickey: We're glad to have you here. I want to give a little more background on Karyn. So she's a tenured full professor in health and exercise science. She's the director of the Translational Research on Aging and Chronic Disease Lab. One of a number of labs housed within our human performance clinical research laboratory, and also associate director of the Center for Healthy Aging. So Karyn has a hat stand that is always full.

So we want to know more about Karyn, the scholar, and Karyn, the person, the human being. Now I'm going to start with here at CSU. We're interested in sort of the big challenges, big problems that you pursue in your lab, with your trainees, and with your collaborators.

Karyn Hamilton: So I guess if I had to frame sort of the biggest problem that we're trying to address, it's always been aging focused, but it's probably shifted a little bit as we've identified what we think is a big problem that explains, at least in part why we're not already helping people to live longer, healthier lives with a focus on the healthier. So we use the term health span a lot. We want people to not just have an extended lifespan and live to be 150. We want them to live all of their years as healthy as they possibly can. Sometimes people graph that as falling off a cliff. Healthy, healthy, healthy, and then good riddance.

So some of the kind of things that we focus on are how do we take all of the basic lab discoveries that the world of people focusing on aging have identified? What challenges do ourselves face as we start getting older, we know what those are, what stresses are they, we know what to target, but how do we do a better job at targeting them and really parlaying them or translating them into effective and accessible ways that people can make changes to promote their own healthy aging. And we focus on the cells themselves a lot of the time models that'll help us to get to the humans and then the humans as well.

Matt Hickey: There's this cool little organelle inside of cells that science nerds sometimes get geeked up about. So can you tell us a little bit more about at least one of the targets or areas of interest for you in your lab?

Karyn Hamilton: Yeah, for sure. So we know through the collective we's body of work that there's at least 14, 15 different key changes in cells that all interact with one another during these progression towards what you would consider aging for your own self. And everybody has their favorite. And of course, we sometimes put that at the center of these interacting cell stresses and mechanisms of cellular aging. And we really are interested in cellular energetics and the mitochondria or the organelles you're pointing toward. I think the trainee in my lab on the nearly Dr. Maureen Walsh is probably the biggest mitochondriac that's come out of my lab before. And she bills herself as a mitochondriac, and she's extremely talented in being able to essentially use chemicals and protocols to dissect in mitochondria where the problem is or how we might fix aging, if you want to think of it that way. So yeah, we're nerds when it comes to mitochondria.

Matt Hickey: So you're interested in these powerhouses of the cell, if people remember their undergraduate biology classes?

Karyn Hamilton: Yes.

Matt Hickey: And when those powerhouses are compromised in their capacity to meet the energy requirements of the cell, what happens? Who cares?

Karyn Hamilton: All heck breaks loose. So some of the other things that we know happen in cells with aging is that we can't maintain a functional proteome. So we have so many different proteins in cells and they can be there, but if they aren't being turned over and modified the way that they need to be functional, then again, your cells probably are not going to age in a healthy way. But that's a very energetically costly thing to do, to maintain a proteome, to synthesize new proteins is the single most energetically expensive things to do in cells.

So the mitochondria are important just for providing the cash to be able to turn the proteins over. And so that's a very direct relationship there. Degrading damaged proteins, everything in the cells require energy, and most of that energy comes from mitochondrial energy production or ATP production. So yes, and then we could just tie it into all kinds of other things, cell senescence and inflammation, and it just gets nerdier and nerdier as we go on.

But we do believe that that helping to really target mitochondrial energetics is a great place to start, especially if we can do it earlier on before cells start having problems with maintaining their proteome. And I mean, I am in the department of health and exercise science, so we know that one of the best ways to do that, if you can inspire and motivate people to adhere to exercise is exercise. That's one of the best ways to maintain mitochondrial function.

Matt Hickey: So this is an interest that developed over time. And so we want to walk the reel of Karyn's life back a year or two or 10 or 15 years.

Karyn Hamilton: Reel's getting bigger and bigger.

Matt Hickey: Yeah. Well, more memories as we say, but we're interested in your academic journey. So where did you grow up? What prompted you to go to the BS conferring institution you went to? And we'll continue that journey until we were lucky enough to recruit you to CSU.

Karyn Hamilton: I really was never all that interested in science pre-college, pre-university. No, it's just another class to take. Now I didn't have a true academic or scholastic passion in school, I don't think in high school or I did fine at it, but it wasn't really what tripped my trigger.

Matt Hickey: What did trip your trigger at that time?

Karyn Hamilton: I really didn't know, to be perfectly honest. I think like so many kids, I was very motivated to do well at everything I did, but I didn't say, "This is what I'm going to be really good at" and start pushing the other things that I was less good at away. I just felt that pressure to do everything that you do well, which is probably not how I would encourage children to move through.

Matt Hickey: It's common though.

Karyn Hamilton: Yeah, it really is. So this shows you that I really was not all that intelligent. I had a father who told me that he always told me he wanted me to be an engineer. So I thought, "Why on earth? Why do you want me to drive a train?" I just never really understood that. I grew up in a state with only one university.

Matt Hickey: And what state is that?

Karyn Hamilton: That state is Wyoming. And so a lot of people that target university as their next step go to University of Wyoming, which made me not want to.

Matt Hickey: Beautiful downtown Laramie, as we say. Right?

Karyn Hamilton: Yes. Yes. So I was an athlete, so I thought my only other real chance to find some extra money to go to a university that I want to go to is to be proactive about trying to get an athletic scholarship. Then I did get a scholarship to Montana State University.

Avery Martin: What was your sport?

Karyn Hamilton: Gymnastics. Yes.

Matt Hickey: What'd you do?

Karyn Hamilton: I did balance beam.

Matt Hickey: Oh, wow.

Karyn Hamilton: But I tried doing lots of other things. So this segues into when did you stop doing gymnastics? I missed a release move and dislocated both my elbows.

Avery Martin: Oh, my goodness.

Karyn Hamilton: So that was the end of my gymnastics career, but luckily I kind of figured out what I wanted to study by that point. So I actually started out in engineering because my dad told me I should start out in engineering, and I was good at math. That was fine, but I was bored. Turns out nobody was going to let me drive a train.

Matt Hickey: That takes the fun out of it.

Karyn Hamilton: Totally, yes. So along the way, I figured out I was taking lots of sciences as well. Finally got to a class called biochemistry, and I figured out that biochemistry tripped my trigger, and that was because all it was was a study of what happens after you chew your food, essentially. So that's what led me to nutrition.

Matt Hickey: This is part of why I'm so fond of Karyn, because not everybody I talk to adores biochemistry and we happen to share that interest. So I've been a fan for a long time because somebody else I can talk to.

Avery Martin: That's awesome.

Karyn Hamilton: So I did not major in biochemistry. I got a minor in it and studied nutrition, and I finally found something that I actually really cared about. So that's what led me to that.

Matt Hickey: And you pursued the licensure option, the RD?

Karyn Hamilton: I did. I did, and I did something. I think this comes into a question I was expecting you to ask a little bit later. In order to get the licensure, I did a internship at the University of California San Francisco. That was my first kind of paid job that depended on me having a degree. Wasn't paid very much. Certainly not enough to live in San Francisco.

Matt Hickey: That must've been a bit of culture shock in some ways?

Karyn Hamilton: It was.

Matt Hickey: We went from Sheridan to Bozeman, to San Francisco. That's a square wave, if I might say so.

Karyn Hamilton: Yes.

Matt Hickey: What was it like?

Karyn Hamilton: It was awesome. Yeah. It was everything I expected it to be and more. It was wonderful. It was my first exposure to research. I had no exposure to research as an undergrad, gave me my first taste of city living and living without a car, which anybody who grows up in a big square state like Wyoming or Colorado, you depend on a car. But then I also lived there during the big earthquake that happened during the World Series. So that made me realize I didn't really want to live on that particular fault line. That was not my favorite natural disaster. So that's why I didn't make my home there.

Matt Hickey: So after San Francisco, what came next?

Karyn Hamilton: Well, nobody told me that my next move, I was actually just following the same fault line up the coast. I went to Seattle afterwards. I fled Northern California and went to Washington and eventually got my first actual job. I call it my first grownup job where I was paid a good salary as a clinical dietician.

Matt Hickey: At UW?

Karyn Hamilton: It was a University of Washington affiliated institution, but it was their county hospital, and it's also the burn and trauma center for the Pacific Northwest. So it was an intense place to work as a critical care nutritionist.

Avery Martin: I bet.

Matt Hickey: How long?

Karyn Hamilton: I did that for almost five years.

Matt Hickey: And at some point, the graduate school notion wandered across the radar screen somehow?

Karyn Hamilton: I would say two things made me realize I couldn't stay in that position for a while. I was paid well, I enjoyed it, but I tended to, I mean, I would see the most injured of the injured there.

Matt Hickey: Had to be so hard.

Karyn Hamilton: Yeah. I had a really hard time separating. I would be afraid that I would end up seeing the two of you there at some point. I just forgot that that was a very tiny slice of people that end up unfortunately getting hurt that badly. And it was affecting my quality of life and health, I think.

But then also I got involved in some clinical research when I was there, and it was really interesting. I was finally on part of the team carrying out the studies to test hypotheses. So my first hypothesis driven research, looking at nutrition and healing, and I thought, "I could maybe do this." I wasn't a mitochondriac yet.

Matt Hickey: You were, you just didn't know it yet.

Karyn Hamilton: I just didn't know it. I didn't know it yet.

Avery Martin: It was in development.

Karyn Hamilton: It was, yes. Yeah.

Matt Hickey: And so the next step?

Karyn Hamilton: I took a very low risk next step and went back to my undergraduate institution for my master's degree. It served some personal needs at the time as well. I already had connections in sort of the equivalent of our college right now. And they had a new faculty member who was doing some stuff that I thought sounded interesting, and he was recruiting graduate students. So I started doing a degree in exercise physiology, I think it was called there. Ended up not being at all what I wanted to study, but I think when you do a master's degree, you're really just learning the scientific process, and it certainly served that purpose.

Matt Hickey: I'm struck by how often I tell master's students that the process matters more than the product. As we move along the academic ladder of sorts, that unfortunately gets flipped to some extent. So yeah, it's a good observation.

So two years back in Bozeman? So again, some point in this two year process. Okay, now I'm starting to hunt for a PhD program, mentor, et cetera. What was that process like for you?

Karyn Hamilton: I got bit by a bug, you're going to like this, in my protein biochemistry course as a master's degree student. Yes. And started learning about these proteins called molecular chaperones. Kind of a sexy little name. First of all, I loved that this idea of these proteins that their whole job or at the time we really thought this was their primary job, we now know they do so many different things, but was to escort nascent, newly synthesized proteins, make sure they get to where they're supposed to for function in the cell, help them to fold, help them to get modified after being translated.

And this was the coolest part. I'd had no idea that good things happened in cells when they were stressed. And so this particular instructor inspired me by teaching me or giving me a project where I could study different stresses and see how cells responded in terms of making these molecular chaperones. So I really did think that was insanely cool. So I got on what was then a platform. There's a different one at NIH now to see who's been funded recently to study exercise as a stress and these molecular chaperones. And that's what led me to my mentor.

Matt Hickey: Where did you go?

Karyn Hamilton: I found a gentleman named Scott Powers who was at the University of Florida. So I figured I'm just kind of hopping from land-grant institution to land-grant institution.

Matt Hickey: I have to interject, Dr. Powers is a legend in our field.

Karyn Hamilton: He's a legend. Yeah.

Matt Hickey: Great guy, and very well known.

Karyn Hamilton: And I'll say that I appreciated the science he was doing. I think I just wasn't socially aware enough to realize what a legend he really was in exercise physiology. And I'm really glad that I didn't, because I would've been terrified to call him if I didn't have really the confidence to call a legend. But I did. And the timing, I think timing is always so important.

Matt Hickey: It sure is.

Karyn Hamilton: Yeah. The timing was right. He knew he'd gotten a grant to study exercise and the role of these heat shock proteins in the heart following exercise in protecting the heart against a heart attack. It was perfect timing.

Matt Hickey: So Bozeman to Gainesville.

Karyn Hamilton: Bozeman to Gainesville.

Matt Hickey: Hop, skip and a jump.

Karyn Hamilton: Yes.

Matt Hickey: And the work you did for your dissertation, again was cardiac expression of heat shock proteins?

Karyn Hamilton: Yes.

Matt Hickey: Postdoc discussions with Scott. Again, the mentoring theme here, how did that all work?

Karyn Hamilton: So he, I think, knew that what I really needed from a mentor was just kindness and somebody that I can emulate. He led by example. He treated everybody as adult intelligent humans who could make their own decisions. And when we needed particular guidance, we'd ask for it and he would give it to us. And so I think in retrospect, I probably didn't ask for much guidance on my first postdoc. I knew I wanted to be at a non land-grant institution. I kind of wanted to see what it felt like at a medical center setting. So I knew that that was a kind of criterion.

Now, I was kind of looking for what's my happiness, my bliss when I do finally get the next grownup job. I kind of wanted to see what it was like to be mentored by a female scientist. And I did the same thing, went back and looked in the database that who'd just gotten grants to study these interesting chaperone proteins and stress. And that's how I found my first postdoc advisor.

Matt Hickey: So who was this mystery female scientist that you did your postdoc?

Karyn Hamilton: Her name is Anne Knowlton, and she was a very successful researcher in cardiac medicine. When I worked with her this was at the Texas Medical Center at Baylor College of Medicine in Houston. She was one of, so if you know Baylor College of Medicine's heart history, that's where the DeBakey Heart Center is. So very cutting edge, leading the charge on heart transplants, artificial hearts, that kind of thing. And she was one of, I think this is close to correct, I think three female cardiologists on a huge 80 plus faculty of cardiologists.

So she is, was and is, a very strong woman and a brilliant scientist. So it was fun to work with her. She had a very small lab and that worked really well for me. I wrote down a few things that I learned from her, and one of the primary things is that sometimes it's good to be a blank slate, so to speak, that learning to do things the correct way is so much easier than-

Matt Hickey: Unlearning?

Karyn Hamilton: Fixing the things that, unlearning, yeah. So I had no experience with a lot of the things that she was going to want me to do on this grant. And she's like, "That's perfect. I don't want you to know how to do those things." She has been wonderful at giving credit where credit is due. This is kind of the second thing that I really took from her. I mean, I had pretty small roles on things, but she said, "No, you see your role as small. Here are the reasons that I think you need to be given credit in the form of authorship or whatever." So she really shaped my view on making sure that people get credit for what they were doing. And then third, if things aren't going your way professionally, make change happen. She was in a pretty tough position there and she made change happen.

Matt Hickey: That's neat, isn't it?

Karyn Hamilton: Yeah.

Avery Martin: That's really cool.

Matt Hickey: So your next move?

Karyn Hamilton: Yes. So she took a promotion and her next step at another institution, she moved to the University of California Davis. And I had a choice. I could either go with her and go through a fun but time-consuming task of helping her set up a lab or I could figure out what else to do. And at that same time, my PhD mentor, Scott Powers had... These are my words, not his, but he had decided to step up into a department head position for a short period of time. His goal, again, my words, were to keep the department in a way that he loved the department. That was his motivation, I believe.

But what he really wanted to be able to do that is somebody who could provide some leadership in his lab while he was doing that. So the timing, again was perfect. And so I took a second postdoc there that translated into a research assistant professor when I got some funding. So it all worked out perfectly. I don't deserve all that good timing, but maybe just having an eye toward it, I don't know. I don't know. Leveraging things when they become available ends up being the best decision.

Matt Hickey: Somewhere along this line, CSU came to your attention.

Karyn Hamilton: Yeah.

Matt Hickey: How did that happen?

Karyn Hamilton: Well, Scott Powers also knew that he called it God's country. "I know you want to get back to God's country", which really had nothing to do with spirituality or anything. But my home was west. I used to come to what's now the mountain campus as a child for gymnastics camps.

Matt Hickey: I did not know that.

Karyn Hamilton: Every summer or most summers. So I mean, it was twofold. It was great gymnastics training, but it was high altitude training. So your fitness level went up while your skills level were going up. And I think my mom tells me that that's when I used to say, "I'm going to go to CSU for school." Well, I didn't go to CSU for school, so my next step was, "I want to get a job at CSU." And so Scott knew that, and he probably knew very well that it's going to have to be really good timing for a job to open up that you're qualified for with the right timing at CSU. And it did.

Matt Hickey: So when did you land at CSU?

Karyn Hamilton: I landed at CSU in August of 2004.

Avery Martin: Coming up on 20 years.

Karyn Hamilton: I know.

Avery Martin: That's awesome.

Karyn Hamilton: I think I get a pin or something, don't I?

Avery Martin: Yes, yes.

Matt Hickey: So we've been colleagues for 20 years.

Avery Martin: Yes.

Matt Hickey: Which is really kind of fun.

Avery Martin: That's great.

Matt Hickey: It's neat to see. And so your time at CSU, of course you've moved through the academic ranks. You're now a tenured full professor. Talk about sort of benchmarks, if you will, signposts whatever metaphor we want to use about your academic journey as a female scholar here at CSU.

Karyn Hamilton: To be honest, I never until the last probably eight years or so, hadn't really distinguished being a scientist or scholar and being a woman in science. It just didn't cross my mind until I really had to be honest, things that I believed were challenging my progression. I didn't think of myself as different. I was different. I grew up in Wyoming and there's only like 10,000 people in Wyoming. I didn't think of myself as different, less or more capable because I was a woman scientist versus a man in science.

Matt Hickey: Would that the whole world thought like that. That would be nice, right? But you've been involved in a Women in Science network here at CSU-

Karyn Hamilton: I have.

Matt Hickey: For a number of years, so tell us more about that?

Karyn Hamilton: Yes, I have. So I'll credit my department head Barry Braun for connecting me with one of the founders of Women in Science, Candice Mathiason, who invited me to be on their steering committee or their board of directors. Some of the primary things we do are just think about what the next Women in Science symposium or WIS, which is coming up in March of this year, what it's going to look like each year, and how can we best empower as many women in science as well as people identifying in whatever part of the gender spectrum they identify to be the best they can be and be what they want to be.

So that's been fantastic. I feel like I take so much more than I give in that service role because Candy and Sue Vanderwood and several trainees that were on board at the time, and now one of my collaborators, Julia Moreno, they are just such leaders when it comes to DEIJ in lots of respects, but with a focus on women and excellence in science. So it was a perfect way to start focusing on being a woman in science versus just trying to be the best I can be in science. It's one of my favorite service roles here at CSU is being involved in Women in Science.

Matt Hickey: Oh, that's great. We often find it really interesting to ask our guests, "If the Karyn of 2024 could give undergraduate Montana State Karyn some advice, what would you say to yourself?"

Karyn Hamilton: I think it would be the same thing I want students to walk away from my lab with, far more than content knowledge. I just hope that, and this is what I would've told myself as well, that use what you learn during the time that you're learning it in whatever way strikes you. Maybe you came to learn how mitochondria improve healthy aging, but what you really took away was, this is what I can give to other people in science. And I didn't realize this until I had this experience.

So mentoring to me anyway, is not about just teaching science and cranking out publications. It's about helping that person to figure out who they were and who they might want to be. And so I think I missed some writing on the wall when I was a younger person, and hindsight is 20/20, if I had that, I would point some of those things out to myself.

Another thing that took me way too long to learn myself, and I'm probably a little too obnoxious about this, in making sure that this is something that I want for my students. I want them to leverage their circle to grow their network and to work with people. Because better science is done with groups of people that have shared goals, but very different talents and interests.

But those networks should not be formed at the expense of everything else. So only work closely with people who treat them with respect and value their voice, and essentially uphold all of the principles of community that CSU has established. I think that's one of the greatest things that has come out of CSU in the last little while, is this is what we believe and we believe it for everybody. And I've been in the position to share that with people at other institutions, for whatever reason. We provide it when people are applying for a job here, or I have other people that are in different leadership roles that have challenges to make changes in terms of DEIJ kinds of practices. And I share those with them and they're like, 'Oh my gosh, we don't have anything like this" that is meant to be shared across everybody, students, staff, faculty, public community. And so I think that's really important. And so I would tell my young self more about that.

Matt Hickey: When you think about legacy, put yourself 5, 10 years down the road and, "Here are the things that I would like my trainees to think about when I come to mind for them."

Karyn Hamilton: Very little of what I hope for my trainees has to do with science they learned with me and the impact that I want to look back on my career and say I had is not I solved this or I discovered this. And that's not to take away from how much fun it is to develop a science question, address it in a rigorous way, and come up with an answer that leads to the next question. We all love doing that, but I think what makes me the happiest is when young people come into my lab and sometimes they have no idea what they are going to do there or what they're seeking. This is just a logical step at the time.

And I love seeing how they change, how their confidence in themselves grows, how their realization of how many different directions, how many forked paths are going to be ahead of them, the team of people that they can, should and will put in place to help them know which one to take, how it's not the end of the world if they take one route and then later decide, "Uh-huh, I'm going back the other way", that that's actually a really important part of the process.

And that's the kind of thing that makes me really excited. Sometimes I think, "Well, you're just living vicariously through them. That's why you're excited about it." But also I think that is part of mentoring well, right?

Matt Hickey: I was just about to say the same thing, yeah. Very much so.

Karyn Hamilton: Yeah. I'm in touch with most people, maybe not often, but most people that have trained in my lab in some way, shape or form, and I think they're all doing beautifully, and they're sometimes doing exactly what they pictured that they were going to do. Sometimes they're doing something not at all related to what they thought they were going to do, but they follow the path and the timing was right. And they ended up in a place that some of them I'm calling on to come back and talk with trainees in our professional skills class because their path, their route to their current bliss has been so unorthodox, I guess if you could call it that way, untraditional, non-traditional.

One particular former trainee in my lab named Dr. Elise Donovan, she says, "There's no right path. There's just your path." And that's one of my favorite things that she tells the trainees in the class that she always visits. And that's the impact that I like to have, is knowing that people have figured out what they want to do or figured out that what they're doing is not what they want to do and change it, and they know how to do that.

Matt Hickey: Well said.

Avery Martin: Yeah. That's beautiful. So we talked about your impact on your mentees and those who were in the lab, but I am still curious about your impact on science as a whole, how you've seen your research in action from the cellular level to someone's life being changed, someone's health span being lengthened. Tell us a little bit about that.

Karyn Hamilton: I'm afraid that I don't think I'll ever be able to see something that my lab did that directly accounts for an individual or mankind womankind personkind's extended health span. I think I'm one piece of a tiny puzzle there, helping to unravel interactions between all of the things that we know contribute to cellular aging. This isn't a huge focus of my lab, but it's been there from the very beginning, kind of sprinkled in, starting with a doctoral student who was challenged to write a review paper for a class, and we encouraged him to write it on exercise and pharmaceutical treatment, pharmacological intervention, the interaction between them, is it always good? So this kind of overlying question of, "Do two things that are individually good for cellular health, when you put them together, do they always make a better thing for cellular and organismal health?" And the two things we usually focus on are exercise and wonder drug candidate A, B, or C.

And sometimes they play just fine together. Very seldom have we seen, and we've only seen it in a preclinical, so not in humans yet, way. They may be better together than either of them are individually. That doesn't seem to so far be the case frequently. And then sometimes-

Matt Hickey: Unfortunately.

Karyn Hamilton: And sometimes they do not do well together. So one of a group of people who've been identifying now that a really commonly used in safe and effective drug for helping manage type two diabetes, when you combine it with exercise, it can blunt some of the really well-known beneficial adaptations that occur when you are able to adhere to exercise. So I don't know. I would love to think in a dream world that clinicians who are seeing patients who, let's say I have new clinical symptoms and I'm starting to have glucose intolerance, but I'm not very physically active.

I think a really nice take-home message from that is if you think you have somebody who's likely to begin and adhere to an exercise program, that probably has greater broad ranging benefits than allowing them to not introduce this new behavior into their life and only introducing them to this one compound. But clinicians have such a short period of time with their patients. They can care a hundred percent, but they only have 10% of the time that it takes to really figure out what that person's likely to adhere to and benefit the most from. So I could really get on a soapbox about all the things that are wrong with our healthcare system, but that's probably not why you invited me here. But I think those are pretty impactful studies. They're hard to get funded. I don't know why. I don't know why. Our most prominent federal funding agencies don't seem to be as interested as I think they should be.

Matt Hickey: I'm convinced it's a form of institutional myopia, it's ossification, whatever kind of word we want to think about. It's unfortunate. I mean, given a 30 plus billion a year budget, you think we'd be able to be more creative.

Karyn Hamilton: One of the other myopic things that my greater research group, so I have such fantastic collaborators. I've mentioned Julie Moreno, Nicole Ehrhart, who's the director of Center for Healthy Aging, Kelly Santangelo, that's a tiny group of them. We're lucky enough to have a catalyst grant that brought together 11 of us that are all really interested in this idea of doing better at translating the things we know should be good targets to help cells and whole organisms age more healthfully, translating that to actual clinical approaches. It needs to be faster because we're going to have a much bigger aging population than we've ever had before across the whole globe.

So back to myopia, and I'm very grateful for federal funding, but there's this very deeply entrenched mouse to man way of doing science because mice are a very powerful way to understand what a gene does, what a protein does. Might it be a good target, what's the function of it? You can't do that in all animals, but we know that there's lots of animals that age much more like humans than a mouse does. They age with all of the morbidities, the multi morbidities of aging, just like we do. They succumb to the same diseases we do.

Matt Hickey: And often they're exposed to the same environment that we're exposed to.

Karyn Hamilton: They're exposed to the same environment. They breathe the wildfire smoke. They often eat the same food. So we think that we can do translational aging research much better. But the myopia is that people who make decisions on federal funding are just really entrenched in this. "If it works in a mouse really, really well, we'll take it to man and see how it goes." My line about that is we need to get people's minds wrapped around this idea that the models need to be, they're necessarily complicated because aging humans are necessarily complicated. Yes. I guess, yeah, that would be wonderful. Before I retire, to see that that's been something that NSF, NIH, everybody embraces, is that we can do better at translating from the bench to making ourselves and our grandparents age more healthily.

Matt Hickey: Well said. Well, thanks for coming over and hanging out with us for a little while.

Karyn Hamilton: Thank you. This has been fun.

Matt Hickey: Good. I'm glad to hear that. That's always the goal. Another great interview is in the books. Thank you for listening to this episode of Health and Human Science Matters.

Avery Martin: Stay tuned for the next episode. It's on the way. In the meantime, go listen to our episodes from seasons one through four. And if you want to learn more about our College of Health and Human Sciences at CSU, go to www.chhs.colostate.edu.