# Health and Human Science Matters Season 3, Episode 3: Tom LaRocca

Tom: I always tell people, and this is true, that I think I was genuinely interested in the idea of healthspan before I even knew what that term was. I am no longer an athlete, but I used to be a very mediocre triathlete and I remember my brother and I would do these races and we would always see these guys and gals in their 70s and 80s doing these pretty intense triathlons and I remember at the time thinking, that is so cool. How can I live to be that healthy and sort of with it and on top of it at that age, which really is exactly what I was describing before, right? It's a model of healthspan.

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

Matt: 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. 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 friend and colleague from my home department, health and exercise science, Dr. Tom LaRocca. Tom, welcome.

Tom: Hi, Matt. Thanks for having me.

Avery: Yeah, of course.

Matt: We're glad to have you come join us. I want to start with some news that I think is maybe out there, but you're celebrating a new RO1 from the National Institutes of Health.

Tom: That's right.

Avery: So talk to our listeners who may not know what an RO1 is. Tell folks about this grant.

Tom: Yeah. So an RO1 is a grant from the National Institutes of Health. It's sort of the gold standard big grant that a professor investigator can get that funds the lab for a good chunk of time. In our case, it's a five-year grant that will really support most of the work that we do ...

Matt: And [inaudible 00:01:45].

Tom: ... about that.

Avery: Indeed.

Tom: Thank you.

Matt: Congratulations. And I want to reinforce that early career investigators like Tom don't often this early get RO1. And so he's been ahead of the curve since the moment we met him.

Tom: Thanks, Matt. You're too kind.

Matt: I'd say that's somewhat tongue in cheek, but I want to sort of serve up your time to talk by reflecting on when Tom gave a talk as part of his interview process a few years ago, I was blown away. It was the best job interview talk I've ever heard in my life.

Tom: Again, far too kind.

Matt: I'm being quite serious.

Tom: Thank you.

Matt: Tom, he brings multiple gifts and we may wander a little bit and talk about his teaching as well because I sat there that day and I thought here's a guy that has a gift for communication. And again, I'm looking for a job that's got a heavy research emphasis, but boy, there was a sterling element of teaching in that presentation you gave that day. And my first reaction was I wish I could wind the clock back and be one of his students so we're glad that you're here.

Tom: Thank you. No. I'm very happy to be here.

Matt: So talk to us about the Healthspan Biology Laboratory. When you think about here are the big problems that we're trying to tackle in my lab, I want you to share with our listeners what they are.

Tom: Sure. Yeah. The biggest version of the problem is that we know that the world's population is aging. So the number of older adults in all the countries across the world is increasing pretty rapidly. And the problem there is that as people age, we know that they're more inclined or at risk for diseases of aging. And so with rapidly growing numbers of older adults, that means rapidly growing numbers of folks with disease. So we've named our lab the Healthspan Biology Lab because the concept that's embedded there is that we are trying to figure out ways to help people not necessarily live longer, but to live longer in better health. So that as all of us age and as our world's population ages, we can have folks living longer, healthier, and spending less time with those diseases that I was just describing.

Matt: As opposed to merely pushing out the lifespan, which may involve a decade of disability or something along these lines. We want to push the healthspan out so that those are, that are better aligned.

Tom: Right. Yeah. So some folks could take issue with it, but to oversimplify it, I think this idea resonates with people that it would be great if you could live really vibrantly and well into your 90s or past age of 100 and then just kind of kick the can very rapidly and not spend a lot of time suffering a disease, that's the concept.

Matt: That's fantastic. Now I want to sort of take the camera back before we were lucky enough to recruit you here to CSU and I want you to talk about your educational journey, your pathway to an interest in the study of healthspan biology. And this again, may be family influences, it may be early mentors, it could be some recent ones. We were just talking about some friends right down the road in Boulder that I'm sure we'll hear about. But tell us because we're interested if prospective students are listening to this that there may be some aha moments where I can relate to that and so maybe I can do this thing too, right?

Tom: Yeah. So I always tell people, and this is true, that I think I was genuinely interested in the idea of healthspan before I even knew what that term was. I am no longer an athlete, but I used to be a very mediocre triathlete. And I remember my brother and I would do these races.

Matt: I can relate, I had one of those too a long time ago.

Tom: Yeah. But I would go to these, my brother was into this too and we would go to these races, and we would always see these guys and gals in their 70s and 80s doing these pretty intense triathlons. And I remember at the time thinking, that is so cool. How can I live to be that healthy and sort of with it and on top of it at that age, which really is exactly what I was describing before, right? It's a model of healthspan. So I always kind of had this interest in the concept without even knowing what it was. It became kind of even more personal for me in the next couple of decades. Both my parents actually did not really age too well, largely not faults of their own. My mother had leukemia that kind of came out of nowhere and then she suffered with that for about 10 years. And my dad took on a caregiver role in that scenario. And as many people know, that's a really stressful role.

Matt: Absolutely.

Avery: Yeah.

Tom: So he almost kind of experienced accelerated aging as a result of that I would say. And I saw him decline very rapidly. And after she passed, not too many years later, he developed a neurodegenerative disease and passed away as well.

Avery: Sorry to hear that.

Tom: Yeah, so thanks. So that kind of, all of that, that I just described really framed things for me in terms of thinking about health and how it changes across our lifespans. And I think as a result, I always been interested in that concept in general and then kind of serendipitously, if that's the right word to use, I just happened to end up studying things that were very much related in my research training, or maybe it was a not so serendipitous. Might have been something subconscious going on there, right, so.

Matt: Talk to us about undergrad first.

Tom: Sure. Yeah.

Matt: Let's do the whole nine yards as they say, right?

Tom: So I was a molecular biology major in undergrad back at a small school in Western Massachusetts, Williams College.

Matt: All right. A fine institution.

Tom: Yeah. I wasn't really sure what I wanted to do. I think like many undergrads, I thought initially medical school. I just kind of had an intuitive feeling that that wasn't right for me. When I wrapped up the nearest sort of center of gravity, population-wise was Boston.

Matt: Sure.

Tom: And a lot of people I knew who were graduating were just moving to Boston and getting jobs and figuring it out. So I figured, I'll go there, I'll find something to do. And I didn't know what that would be exactly. At that time, a lot of folks were interviewing for consulting jobs and those kinds of things, and I did a little bit of that, interviewing for those kinds of jobs and it didn't quite sit right with me. But I had some friends who were interviewing for teaching jobs, high school teaching jobs, and they had trained in undergraduate for that specifically, had gotten degrees in education, which I had not done, but I had done some teaching as a teaching assistant in college, and I knew that I enjoyed it and so I figured I would give that a shot. And when I interviewed for those jobs, it felt great. There was something about being there and in a school and thinking about myself in that environment that felt really good. And so that's what I did.

Avery: Nice.

Matt: And you taught for how long?

Tom: For five years.

Avery: Oh, nice.

Matt: And what age?

Tom: So it was all high school. I started teaching biology and algebra actually.

Matt: Because they needed an algebra teacher, right?

Tom: They did. Yeah. They needed an ... Yeah. And it was kind of in Massachusetts at the time, there was a pretty significant shortage of math and science teachers. So even though I hadn't been trained to be a teacher per se, I was able to get that job and they were able to sign a waiver or something that let me do that.

Matt: This is an opportunity to learn how to be light on your feet, right, in many ways. I mean you probably think that high school secondary schools in general, you have got to be flexible.

Tom: Absolutely.

Matt: Adaptable in many ways. So five years as a high school science and math teacher.

Tom: That's right. Yeah. Actually, mostly it was just math and biology for the first year and then I transitioned into chemistry. So I was teaching high school chemistry, including the advanced placement courses for four years.

Matt: I'd be interested in hearing some of the key lessons from that period of your life that still inform how you approach your professional life.

Tom: I give a guest lecture sometimes in Neha Lodha's Capstone course in our department, and she asks me to specifically talk about mentors. And I think at that time was one of the first really fantastic mentors, I had this guy named George Buckley who was a high school science department chair by day and then a instructor at the Harvard Extension School by night.

Matt: Wow.

Tom: Yeah. And he really spearheaded a lot of environmental science programs there and he was just a fantastic guy. And if I learned one thing during that time, it was from him, and I would just say in one word, it was enthusiasm.

Matt: Yeah.

Tom: Yeah. He was just super energetic and he taught the Honors Biology course and every year, he would train a couple of, a good number of the students in that course how to, teach them how to scuba dive and then take them to Bonaire, which is one of the best scuba diving locations in the world, I'm told.

Avery: Wow.

Tom: And do these marine biology lessons.

Matt: Wow.

Tom: Yeah. And students just loved him. And I think really what they gravitated towards was just his excitement around being there and teaching science and sharing things.

Matt: It can rub off on people, right?

Tom: Yeah.

Matt: We were just talking about this with Jaclyn Stephens who preceded you that this classroom environment is so heavily dependent on the individual leading, much more than what's the textbook, even what's the content, right?

Tom: For sure.

Matt: Somebody with some energy and enthusiasm can make what might appear to a student before day one of a class to be able ... No, I've got to take because it's required and I can't graduate without it. And you get somebody that is passionate about what they're doing, who's maybe a gifted storyteller, can illustrate complex stuff in simple ways, light bulbs go on left and right. It's pretty neat and ...

Tom: Yeah.

Matt: Yeah. And that's clearly rubbed off, right? So we go back to my introductory comments. I think your mentor has rubbed off on you in ...

Tom: Yeah. I'm sure he'd be happy to hear that.

Matt: ... some ways.

Avery: Yeah.

Matt: That's great. So some point in time as a high school teacher, of course, you had other decisions begin to sort of cross your mind in terms of maybe go back to grad school, etc. Tell me a little bit about what if anything precipitated that and did you have a long view at that time of I want to be a college professor or was it just I'm looking for something different or?

Tom: Yeah. You know I sort of did have that long view. I realized during that five years that I just enjoyed teaching so much, and I loved talking about science and thinking about ideas and discussing those ideas with students, but I just had this kind of internal itch to maybe develop some of those ideas on my own too. And so I felt that I needed to go to graduate school in order to do some research and learn how to do that on my own. And that to me, that sort of meant that an end goal for me, a logical end goal would be to be in a college classroom.

Matt: Sure. Yeah.

Tom: Yeah.

Matt: So did you investigate MS programs or right into PhD programs? So I think I'm talking about the structure.

Tom: You know what, yeah, I started graduate school in a chemistry PhD program on the East Coast.

Matt: Okay.

Tom: And I just had been teaching chemistry. I thought that was the thing for me. It just wasn't the right fit. But the short answer is yeah, PhD programs directly because I knew that's where I wanted to end up. But I left that chemistry program to go to the University of Colorado in Boulder because I wanted to do something that had more of a human health component to it.

Matt: And how did Boulder get on the radar screen of a chemistry PhD student somewhere back east?

Tom: It's just a tough time in life trying to figure things out and make my way and I knew that where I was not the right fit. I'm a skier and it was a very bad year in Vermont that year. Lots of rain and clouds and that kind of thing. And I thought, I've got to go somewhere where the mountains are big and there's more snow and sunshine and so I came to Colorado, so.

Avery: Found the right place.

Matt: For sure, yeah. And so for our listeners, again, when many of us at least think about PhD programs, we're thinking at least as much about who am I going to train with or as where? And so tell us a little bit about that juxtaposition. We got the where part figured out and I commend you for that decision, right, so.

Tom: Thanks. Yeah, so if I'm being totally honest, especially if there's any students listening, I did not think that clearly about that, I wasn't ... I just knew I needed to change and I wanted to go somewhere where there were programs that might be a good fit in Boulder, fit that description pretty well and it was near the mountains. And then when I applied to the program, this was certainly serendipitous, I was very lucky to get scooped up by Dr. Doug Seals in his group down there. They were, I think at the time, there was some work going on in the lab that really needed some help from students, incoming students who had a little bit of a chemistry and molecular biology-type of background, which is what I had. And so it was just a kind of lucky timing sort of thing.

Matt: So you did your doctoral training with Doug Seals in Boulder. Tell us a little bit about what you did? What questions and problems were you pursuing as a graduate student?

Tom: Yeah, so Doug's lab, to circle back to the beginning, was the first place that I learned that there was a term and a whole set of terms to sort of describe those things that I knew I was interested in without even knowing what they were. That's where I first heard the word healthspan was in Doug's lab. And I came to appreciate the fact that when people talk about studying aging, which is what they do in Doug's lab, that it doesn't just mean looking at older adults and comparing them to very young adults or oversimplifying it to look at age-related diseases, but to really look across the whole lifespan. There's things that we do in our 20s that affect our health in our 30s and 30s to 40s, etc., etc., right?

So in Doug's lab, when I first joined the lab, the primary focus was on cardiovascular health and how it changes as we age, so how our heart and arteries change at the cellular level all the way up to the whole body level. And the short story there is that the health of the heart and arteries tends to decline as most things do as we age, right? But as they decline, the rate at which they decline predicts your risk for related diseases so heart attacks, stroke, things like that. And so we were always studying and looking for ways to understand what was happening at the cellular and biological level that would explain the decline that's happening at the systems or whole body level in the hope that we could learn something that would help us understand how to treat that or prevent it.

Matt: So your dissertation series of studies is a kind of the typical model, right? Other folks at Boulder that might have had a significant sort of mentoring role for you beyond Doug or [inaudible 00:17:04]?

Tom: Yeah. So after Doug's lab in a very roundabout way in my way to post-doctoral research training with Chris Link, and Chris is also in the same department there. He's an associate professor down there now. And he for a long time had been studying neurodegeneration diseases like Alzheimer's disease, ALS, which many people know from the ice bucket challenge. And so if you're kind of keeping track of the storyline now, I was in a lab where I had learned about aging, and the biology of aging and healthspan. And then my dad, if you remember that story had recently passed away from a neurodegenerative disease. Actually, that was at the time that I was in Chris's lab.

Matt: Oh, my God.

Tom: So it just so happened that I sort of made my way into this series of events and training experiences that really aligned with my personal experience.

Avery: Yeah.

Tom: Yeah.

Matt: How long was your postdoc?

Tom: Three years.

Matt: Yeah. Which is fairly typical, they do vary, of course. Sometimes opportunities come up and you jump, so. And how did we get on your radar screen? I know we're not far away so it's a little bit easier, but were you looking, did we go down like pound on your door?

Tom: Yeah, I was looking ... And that's a great question, Matt. I actually don't remember the exact series of events, but I think I came up here to meet with a couple of folks in HES, because at the time I was thinking about submitting an application for a K award, a career development award, which would maybe have been the next logical step after a postdoc. And I was just trying to conceive of who else was on the front range that was doing work that might align with my interests and new training experiences that I could get. And when I was here, I know that Karyn Hamilton at least mentioned this to me, that there was a job posting coming up and then she would share it with me, so. And there's probably some other folks too.

Matt: One of the beauties, again, about it, this is really fun relationship we have with Boulder's, is Tom was on our radar screen for ... Right, it's when we think about job searches, you want to be intentional where you can. So I think there's this reciprocity institutions will woo individuals if they're sort on their radar screen. When you get down to the interview level that there's a mutuality, you're interviewing the environment itself. In many ways, we're interviewing these candidates and when everything clicks, you get good hires and you're off to the races. So we made you an offer, right? You decided to come, you've set up some space. We have this seemingly perpetually expanding human performance clinical research laboratory. So walk us through sort of a standard day in the life of your lab including who's there, who's doing the work with you in your lab, who are some of your collaborators? I'll give a plug for one of our dean's fellows, of course. Aly Cavalier trained with you before she came here. So tell us about you and your team.

Tom: Yeah, so I managed to convince Aly to come from CU Boulder to CSU with me and be my first grad student in the lab. And Aly's ...

Matt: I'm glad you did.

Tom: Yeah, me too. She's been fantastic. So in addition to Aly, she's a fourth year PhD student now. I have three other PhD students in the lab and then two post-doctoral researchers and I think we have three undergrads working in the lab right now. So a good size lab and which I think is fun. And then as far as the day in the life goes, it really kind of depends on who you are and what your projects are.

Matt: Sure.

Tom: I think it's probably fair to say that everybody sort of splits their time evenly in three different ways. Maybe a third is devoted to doing science, so either being in the lab or in the HPCRL and meeting with human subjects and making measurements. And then another third to analyzing data, which we spend quite a lot of time on. And I can explain that in a bit and then another third probably on writing or on building presentations and sharing our research with people.

Matt: And when we talk about projects, labs can mean any of a number of different things, right? So we're not necessarily talking treadmills or motion capture cameras or anything like that. So walk our listeners through what we mean when we're in Tom's lab?

Tom: Right.

Matt: What are we doing?

Tom: So my lab has maybe a little bit of a multiple personalities problem of sorts, right? So this is partly as a result of my training especially in Doug's lab, but also in Chris's lab, too. I've been really convinced that the best way to study healthspan is to use a strong translational approach or angle. And there's lots of different definitions of that but for us, it means using multiple different models. And so some folks in my lab work specifically on clinical research protocols, which means studying people so people who volunteer for research studies. Some people work in the lab actually studying cells that we grow in dishes. And that can be anything from neurons to skin cells, so a variety of different cell types. Some folks in the lab work with mice because there are things that you can do in a mouse that you can't do in a person, obviously.

So if we have a compound or a drug or something that we think might improve brain health, for example, we can't necessarily just give that directly to people if we don't know it's safe or if it works or anything like that so we'll test it in mice first. And then some folks even work on a small nematode worm called C. elegans, which is a very tiny little semi-microscopic worm that is heavily used in aging research because you can grow thousands of them on a small dish in the lab that live for 20 to 30 days. And so if you think you have something that might modify healthspan, which requires looking at lifespan, you can actually do experiments with those worms in the span of a month or so, where even in mice, that would take two or three years so it's a higher throughput lifespan testing model.

Matt: I want to follow up with a couple of questions. So tell us about what the RO1 is funding? What particular studies are embedded in the new RO1?

Tom: So the RO1 is primarily funding a lot of these cell culture work that we do and some I think very cool collaborations that we have mostly with folks at the medical schools. So what I left out of the description of our research and the models before is that one thing that we do, it might sound a little crazy to study all these different organisms and that kind of thing. So what we do a lot of to kind of bridge the gap across them is what we call bioinformatics. And this really is just a fancy word for kind of using high powered computers and computer programs to look at big data, what some people call big data. In our case, that's looking at DNA and RNA from the mice, the cells, the people, the C. elegans worms, right?

Matt: But these might be expression of tens of thousands of genes in response to a intervention.

Tom: Right, yeah. So a lot of times we look at, one of our favorite things to look at is RNA, which is if people remember bio 101, it's transcribed from the DNA when you want to turn a gene on, you transcribe the DNA into its RNA, and the RNA goes out and becomes translated to a protein. And so we do transcriptomics, which means looking at the whole pool of RNA that's in a cell or a person or a worm or whatever the case might be. And so that's, when we do that, we're looking at 10s or 20s, or 30,000 things all at once. So that's the big data, I guess.

Matt: Yes.

Avery: Yes.

Tom: Yeah. So anyway, back to the point of that was that we've started collaborating. We have been for a few years now collaborating with folks at CU Boulder and at the CU Anschutz campus who have been doing clinical studies again in humans for years now and have been biobanking samples, meaning storing samples from these people in their freezers. And then have been really kind enough to share those with us so that we can go and use our bioinformatics approach to look at things like RNA or DNA and see if there are patterns in them that might explain health in the people that they were collected from.

And so the RO1 involves a lot of collaborations with people at the medical school and some samples that they've shared with us. Some biobank samples from large studies that have been done around the country over the last couple of decades, and some of those being brain samples actually. And then a lot of work in cells, like I mentioned, in order to see if the patterns that we can spot in these biobank samples are also visible in neurons and other brain cells when we grow them in a dish. And if so, if we can sort of target them and manipulate them to improve things that we would think would improve brain health.

Matt: And you have doctoral trainees and postdocs that are supported on NIHF mechanisms as well.

Tom: That's right.

Matt: So again, tell our listeners what F means?

Tom: Yeah, I assume that F stands for fellowship.

Matt: Exactly.

Avery: Yes.

Tom: You know, I know it does. I'm not sure I've ever seen that spelled out on the NIH websites anywhere, yeah. So where the R awards are research awards for investigators, the F awards are fellowship awards that are supposed to, or that do support trainees during their research work. So we have, Devin Wahl in the lab is a postdoc who has an F32, and he's been, this is his second year of that now. And he's been doing primarily experiments in mice, he's our mouse guy, testing some compounds that we think will improve brain health of older mice. And then Aly Cavalier who just recently received an F31, which is a pre-doctoral or PhD training fellowship. And that is very tightly related to the RO1s. So she'll be helping with some of the analyses of these biobank samples that I described.

Matt: Cool.

Tom: Yeah.

Matt: And just for added interest to our listeners, when Devin's working with compounds in mice, give us an example of a compound. Is this a derivative from a plant product? Is it an existing drug that we're using off label or?

Tom: Yeah. It's an existing drug that people are, in my world, are pretty interested in as, with the idea that it could potentially be repurposed as a drug that might help with brain aging and neurodegeneration. The technical name of the drug is 3TC, the trade name is Lamivudine, which is actually an old ... not old, it's been around for a couple decades, but HIV drug. And sort of, we're getting into the weeds a little bit now, but if you guys are interested ...

Matt: I'm interested.

Avery: Yeah, we are.

Tom: Yeah. So the focus of a lot of what we're doing in the lab end of the RO1 and of Devon's F32 and Aly's F31 is on trying to understand the lesser known and lesser studied regions of the human genome. So in fact, when we were talking about the transcriptomics and all the genes that we're interested in, most people when they do this kind of work, historically have focused on the part of the genome that codes for the proteins that make us who we are. But that really is only about 2% of the genome. So the great majority of the human genome is non-coding. And the great majority of that is actually repetitive sequences that people have ignored for years, just kind of thinking that they were junk DNA that had accumulated over time. And I always tell people that if you pause and think about that for a hot second, you realize, it makes no sense.

Matt: It doesn't make a whole lot of sense, right?

Tom: But evolution doesn't let things accumulate like that. So what's particularly interesting about that, it's about 50% of the human genome or so, is that much of it is derived from, or at least has origins related to retroviruses. So viruses that kind of got into cells and into the genome over billions of years of evolution. And so most of the time, because that part of the genome is kind of virus-like, it's kept quiet because you don't want virus-like parts of your genome acting up and causing trouble, right?

Avery: Sure.

Tom: So what we've been showing, and other people too, it's not just my lab, but it's becoming a hot topic I think in research on aging and neurodegeneration is that virus-like part of the genome seems to become reawakened or the control of it is lost as we get older. And so now you've got endogenous meaning within your own cells virus-like things acting up. And so what do cells do when they see a virus? They mount an inflammatory response and they fight it off with inflammation, right? And one of the things we know is that almost all diseases of aging have an inflammation component to them.

So we, and again, other folks are thinking that part of what's happening in diseases like Alzheimer's disease for example, is that this virus-like portion of the genome that's been ignored for so long is becoming reawakened, kind of acting up and causing inflammation that's contributing to the disease. Where I'm going with this is that this already FDA approved HIV drug called 3TC is a retrovirus inhibitor. It's an antiretroviral drug because HIV is a retrovirus. And so there's some thought, and again, this is way down the road, there's some thought that drugs like that might actually help to suppress the endogenous virus related events that I was describing. And so Devin's been testing this in mice and we have a paper that we submitted and is currently in revision. We're hoping to get it back out in the next couple of weeks that shows that this 3TC compound really completely restores brain function in old mice.

Matt: Wow.

Tom: Yeah, it's very cool.

Avery: Fascinating.

Matt: I should say so, right?

Tom: Yeah.

Matt: Cool. I want to step for just a second outside of the lab. So still triathlete, what do you do for fun? When you're not doing all this really cool stuff, what occupies Tom's attention?

Tom: Yeah. I guess I'll say that I'm a triathlete on pause.

Avery: Okay.

Matt: I love it.

Avery: [inaudible 00:31:32]

Matt: Look at you.

Tom: Yeah. And we will see. No, I'd love to do a triathlon again someday, but I haven't done one in 15 years or so.

Avery: Oh, well.

Tom: Yeah. So I still do all three of the things involved in triathlons ...

Matt: Okay, good.

Tom: ... but typically not in a row on the same day.

Avery: Okay.

Matt: There's a practice what you preach element to this though, right? You're interested in your own healthspan. It's not just an academic interest, right, so ...

Tom: Right.

Matt: ... staying active is part of that equation.

Tom: Absolutely. Yeah.

Matt: Up in the mountains at all? You're a skier so it's splitboards or are you, you know?

Tom: I still ski.

Matt: With two or one?

Tom: Just two skis.

Matt: Right. That's my man.

Tom: All right. I didn't know.

Matt: Yeah. I much prefer one on each foot.

Tom: All right.

Avery: Yeah.

Tom: Yeah. I have two. I have a four year old and a six year old that occupy quite a lot of my time ...

Avery: I'm sure.

Tom: ... [inaudible 00:32:22] so I don't get to ski quite as much anymore.

Matt: Have you gotten your six year old going yet? That's right around the age when you get the free [inaudible 00:32:29].

Avery: Yeah. Bring them along.

Tom: Yeah, it's a lot of fun.

Matt: Favorite spot?

Tom: We haven't been out a whole lot with them yet. We're hoping to get up to Snowy Range a bunch this year.

Matt: Good.

Tom: My personal favorite spot is Arapahoe Basin. Just when I first moved here, that was where I would go all the time. And we got out there with the kids this past year and they had a lot of fun.

Matt: Ski into June up there most years.

Tom: Yeah.

Matt: So good for you.

Avery: That's great.

Matt: Thanks for allowing me to take you off campus for just a little bit. I want to get back to the training environment because, of course, we talked so much about mentors, influences they have. And I want to flip that and ask you as a mentor, what are some key lessons you hope your trainees take away from their interactions with you?

Tom: I think that, I'll take it back to the high school experience, teaching high school experience. I think that being enthusiastic about what you do makes all the difference in a lot of ways. And I hope the people in my lab would agree with this, that we always try to be excited about what we're doing. And I think in science that's particularly important because we're trying to come up with new ways of thinking about things and new ways of solving problems. And if you're excited about what you're doing, you're more likely to be very curious about what you're doing. And think to be able to sort of look at it from different angles and keep going when the first thing that you do doesn't work out because that's, I think, a very common ...

Matt: Inevitable.

Tom: Yes. Yeah, I always tell my students that I ... Gosh, I don't know what percentage of things I try that doesn't work, but it's a very high percentage of things. Maybe it's 90% of things you know. And that's an interesting job description, right? If you were a neurosurgeon and you didn't do a good job, 90% of the time you'd be out of the job.

Matt: Pretty quickly.

Tom: Yeah. So I think being enthusiastic and understanding that science has that component to it is a really valuable thing to internalize.

Matt: And it helps you to be persistent, right? If the enthusiasm remains and this thirst for discovery remains. Because often ...

Tom: You're right.

Matt: ... we're wandering out into terra incognita, right? Okay, let me try this route, right?

Tom: Right.

Matt: Because I'm getting stymied for whatever, and maybe somebody else will figure it out, but see where else I can wander here to continue to make progress.

Tom: Yeah.

Matt: And it's great.

Tom: And I guess I'll extend on that, Matt, and just say that another thing I try to tell my trainees all the time, and I think they'll agree, is that trying new things and extending yourself into places unknown, it helps if you can develop some confidence around the idea or self belief in the idea that you can figure things out. I think it's very easy to see some other technique in science, some new technique in science that sounds complicated and fancy, and then to be sort of cautious or reluctant or nervous about trying to get into that area. But I think most of us who are doing this can make our way even into those complicated new areas if we sort take the time and again if we're really enthusiastic and curious about learning how to do it, so.

Avery: Right.

Matt: And willing, no matter how long we've been doing it to be taught.

Tom: Yes.

Matt: Right. So I want to wrap up with a couple of questions about the environment that we share here at CSU. First one is the institutional one, right? So CSU is a land-grant institution. This is something that we take, the institution takes very seriously, which I've always admired about CSU. What does that mean to you, to work at a land-grant institution?

Tom: Yeah. The reason that I truly appreciate that is that all of the, much of the stuff that I've described so far while sitting here could be very esoteric, right? I'm in a lab and I've got semi-microscopic worms or neurons that I'm growing in a dish and I have this drug and I'm targeting this part of the genome. But at the end of the day, what we're supposed to be doing as biomedical researchers is learning things that can help to improve or extend human health. And I think that's fundamentally in line with what we're trying to do at a land-grant institution is to all of the scholarship and work that we do here really is like our mission to connect that back to our constituents and the people. So I really truly appreciate being in that environment. And it kind of helps you stay grounded when you're talking about the 50% of the genome that nobody understands, right?

Avery: Yeah.

Matt: Yeah.

Tom: Yeah.

Matt: It reminds us what we're after at the end of the day.

Tom: Right. Yeah.

Matt: Yeah. That's great. So the next step down in this institution is this College of Health and Human Sciences. Of course, you're a relatively new hire, but I'd like you to reflect on opportunities that this diverse and dynamic college provide to young investigators. What do you like best about being a faculty member in the College of Health and Human Sciences?

Tom: Yeah, I'll take that back to the very beginning too, because I stepped out of a chemistry track graduate program to get closer to science that involved people and was applicable to people. And to me, being in the College of Health and Human Sciences is the perfect fit because we do all the crazy stuff that I've just been describing. But then we're next door to people who are really much more focused on big picture human health-related questions. And that includes anything from health to social questions and issues and developmental questions and issues and even sort of more design and arts-related topics. And I think these are all, even if I am interested in the biology of healthspan, I'm aware enough to appreciate that healthspan involves psychological health, it involves social health, it involves all these kinds of things. And I think being surrounded by people who are doing work in those areas is perfect for me. It's better than being in a place where everybody's focusing at the very cellular and molecular level ...

Matt: That's great.

Tom: ... so you can keep track of that.

Avery: That's awesome.

Matt: It's a cool environment.

Tom: Yeah.

Avery: Yes, it is.

Tom: I agree.

Matt: On behalf of the college, Tom, I want to thank you for coming to join us today and sharing some stories, ski stories and science stories, both so we appreciate that.

Tom: Yeah.

Avery: Yeah.

Tom: My pleasure. Thanks for having me.

Avery: Of course. This was great, man. Thank you.

Matt: Good fun. And that's the show. Thank you for listening to another episode of Health and Human Science Matters. If you want to learn more about our College of Health and Human Sciences, go to www.chhs.colostate.edu.

Avery: And if you haven't already, add Health and Human Science Matters to your library of podcasts, give us a follow, and definitely give us a rating.

Matt: I think we're worth at least five stars.

Avery: Bare minimum. We would be that. We would definitely be that.