Alex Chaim: Building a Life and Community in Science

[MUSIC] Frank Silva: Welcome to Mi Camino, a series where we interview faculty and alumni on their paths through education and beyond. Today, we're joined by Alex Chaim, principal investigator of the Chaim Lab and an assistant professor of cell and developmental biology at UC San Diego. His journey started in Caracas, Venezuela, where his passion for biology bloomed and brought him to the States to pursue a life of research and mentorship. Welcome, Alex. Thank you so much for being here today with us.

Alex Chaim: Thank you very much. I'm very excited to be here.

Frank Silva: We always like to start our conversations off with just getting to know a little bit more about our guest. So tell us a little bit about what your life was like growing up, and how did your family and your parents inspire your passion for biology?

Alex Chaim: My parents inspired my interest in biology in very different ways, actually. So my dad, he's a brewmaster, so he brewed beer for his living, basically. He's now retired, but he did it for many years. I think that I got a lot of my love for nature from him. I was, and I'm very lucky that both my parents really follow their passion in what they wanted to be as professionals. My mom is a first generation college students, and she's a therapist. I'm not sure how exactly it went with her parents and the conversation she had, but she was the first one in her family to go to college. She didn't go to any profession. She actually went to one that really spoke to her, which was psychology. My dad the same.

As a 17-year-old, he decided he wanted to become a brewmaster and moved from Ecuador to Germany to do so, which thinking back in those days, it's incredible that he did that. They've really taught me and my sister to really follow our passion. In my case, that was biology and in my sister's case, it's also therapy. I think both of our parents really impacted us and gave us free reign to think about how we felt about different potential professional paths, and we both chose the one we liked.

Frank Silva: How did biology start? Did that happen in middle school, in high school? Was there a particular high school teacher that sparked that for you?

Alex Chaim: Yes, I remember very well it was ninth grade. [inaudible] is her name. She taught us about Mendel and Mendelian laws, and I loved every bit of it. I couldn't wait to calculate what the inheritance patterns would be, and I really enjoyed that part. Then the lab portion of it, I really enjoyed it as well. Since that moment, I knew I wanted to be a biologist and run my own research lab, which is crazy that it's actually what I'm doing. I don't know, 30, 25 years later. So since ninth grade, I knew I wanted to be exactly where I am right now because I started learning about Mendel.

Frank Silva: So did you do all this classic fruit fly experiments?

Alex Chaim: Yes. We did. Yes.

Frank Silva: So that hooked you?

Alex Chaim: Yes, that hooked me. First, the theory, I really love the theory of it, and then when we actually applied it in the lab, it was amazing. To actually count the flies and see that the proportions came out to be what you thought they would be was awesome.

Frank Silva: Yeah, it's awesome. It sparked something inside you.

Alex Chaim: Yes, definitely.

Frank Silva: Why don't we share a little bit about your lab and your research and what it is that you study and what it is that your scholarly work is right now?

Alex Chaim: Yeah, so in my lab, we're all about RNA damage. That probably doesn't mean much to you just yet and doesn't actually to that many people because it's a fairly new topic that we're trying to develop. I like talking about RNA damage, starting with the way I learned about it, which is based on DNA damage. Just for some context, and during my PhD, I studied the way cells repair DNA damage and what actually causes DNA damage and what happens when it's left unrepaired. Long story short, one of the many things that can happen is that it can create mutations that can lead to cancer. You might ask yourself, what can create DNA damage? The answer is basically everything.

UV light, the reason why you should wear sunblock or be careful sometimes is because UV light can create a lot of damage to your cells. Actually, oxygen is pretty bad for your cells. The same way it's actually absolutely necessary, but it can create very specific types of damage in your cells. It's not a big deal because we have hundreds of enzymes that deal with this damage on a daily basis. But if there's either too much damage or for one reason or another, your body or your cells are not as good at repairing some kinds of damage, you can develop disease.

But later during my PhD, I realized that everything that damages DNA also damages RNA. Historically, people have thought that it's not a big deal to damage RNA because you can make it again. So you would just get rid of it and start over, and then you would have a new undamaged molecule. But there's many scenarios, for example, in neuro degeneration, where there's a lot of oxidative stress components that constantly damage all the molecules in your cells, including RNA. Even if you were to get rid of it, if you make it all over again, it's very likely that it will get oxidized again, in this case, oxidized.

So we're very interested in understanding if that oxidation or damage of RNA is actually leading into development of disease. One of the reasons why we think this might be the case is because it's been shown that there's very high levels of damaged RNA in many animal models of these diseases way before there's any clinical manifestation of the disease. It's something that happens very early on. We don't know yet if it's actually playing a role in how the disease develops, but it's definitely there, and we're trying to understand what it's doing.

Frank Silva: I think that's one of the most impressive things about being a researcher and a scholar, is that you can be at the cutting edge of breakthroughs, and it sounds like this is what you're doing, it sounds like very cutting edge research. I think that's also something that our scholars who are listening can be inspired by is that if they want to be at the vanguard of breakthroughs, whatever their interests might be, whether it's science or whether it's the arts and humanities or social sciences, that that can happen at UC San Diego and at other tier R1 research institutions. I'm wondering you came from Venezuela here to the US to get your doctorates, is that correct?

Alex Chaim: Correct.

Frank Silva: Can you share a little bit about what that was like? Was it a culture shock? YHow was that for you?

Alex Chaim: All of the above, probably. It was both amazing and very challenging at the same time. I was obviously very proud to come to the US and to a place like MIT. It's the stuff you see in the movies, and it was happening to me. But at the same time, I left my family behind. I left my country behind. I thought I spoke English, but I didn't really, I obviously spoke English, but probably not at the level that everyone else around me was speaking. It was definitely a culture shock, it was a language shock, it was an environment and temperature shock. It's I think the shock that many people go through as they move countries, they move states.

But also, in my particular case, I was leaving Venezuela because it was not in a great political situation, which also meant that my family was leaving in Venezuela, which also meant that we all left home and I didn't really have a home to go back to. I learned a lot. Again, there's no better way of saying that it was both amazing, and very challenging at the same time.

Frank Silva: The interesting thing is here in the US, we have young Latinos or other students who come to UC San Diego who might be the very first time that they are in a community that isn't really reflective of their lived experience. It sounds like that was something that happened to you culturally. You also said, like geographically leaving a war environment and going into a cold environment. What was it that supported you through that process, through that transition? Were there mentors? Were there did you find community and if so, how?

Alex Chaim: I found community. It's true that no one had my exact leave experiences, but there were many people who were on the same boat as me. So many people were coming from many different countries. I had friends from all over the place, honestly, which was great to experience. I also met some professors that also came from abroad and had a little bit of a good idea of what this transition was like. Then I happened to have a roommate, like the one other Venezuelan that I knew of that was going through something similar to me. Something actually that really helped me was I had never heard of squash before, for example, and I started playing squash with my roommate, which was a great transition into, I guess, college living here, and we met many people that way and integrated a lot. But community definitely helped a lot.

Frank Silva: How has mentorship and community shaped your development as a scientist?

Alex Chaim: I 100% wouldn't be where I am without everything that my mentors did for me. This started all the way back in during undergrad, back in Venezuela, during my PhD, during my postdoc, and even now as a professor, I have more senior mentors that held me on, I was just texting with one of them. It's definitely played an incredible role. I can go all the way back to Venezuela. Even actually, I was telling you about [inaudible] in ninth grade. We still chat sometimes. She definitely was and is an important part of my life.

In college, many of my professors had gone abroad and got very well educated, did their PhDs in many, many different places, and came back to educate people like me. I was always aware of what they did and what impact they had on me. Then during my PhD, it was very similar. Again, I'm happy to talk about details, but the lab I ended up doing my dissertation. In Leona, she really was a model on how to do science and how to treat people and how open to be with people about their journey and how they think about science and how they think about their group.

Then even in my postdoc, Gene who was my PI at that point, he's very pragmatic and open about the way he thinks and about how he applies his knowledge and his plans in his lab and how he empowers people to do things. So they've had an incredible impact on me.

Frank Silva: How have you translated that into shaping either your instruction or the environment in your lab?

Alex Chaim: Again, I'm very aware of the impact they had on me, so I really tried to pick the things that I think were and are the best from each one of them and try to apply it in my lab. For example, going from the most recent bag from Gene, I really learned to empower people to really guide their project and own it, and really try to give them the tools they need to succeed. Gene was and is extremely good at that. When people come into my lab, I try to have them think very hard about what they like and what they don't like.

Then I try to give them the opportunity to develop those ideas with my guidance, if that's what they want. But if they want more space, I try to give it to them. Really empowering them, that came from Gene. From Leona, her science is incredible. She was particularly good with being open about her journey and really humanizing the whole endeavor. She would invite us to her

house to celebrate accomplishments, I do that in my lab as well. They definitely shape how I do things in my lab.

Frank Silva: You know what I really appreciated when we were chatting a little bit earlier is how you've humanized science and research and the teaching of science. I would love if you would just give some examples because I recall you talking about the class that you teach and how you utilize the very first lecture to let the scholars, let the students in your class know that you're a human being. Can you share a little bit about that?

Alex Chaim: Of course. The class I teach, which is cell biology, I was very lucky when I started that I have a colleague, Andreas, who has studied for several years, and he was amazing at sharing with me all his knowledge and what had gone well and not as well when he started. Amongst those things, he shared with me that in the first class, he loves telling who he is and make sure that the students understood that there's more than just being a student and that he's very aware that they might have other things going on in their lives, and that really resonated with me. I had done in other types of setups before, but not really in a huge class like that before. I implemented the same thing in my class.

One of the first things I do is that I talk about my journey, where I come from. Basically, some of the things we've been discussing. I show a picture of my kids. I tell them when they were born, sort of to put in context that I was doing science and learning while I was still being a father and a husband and a member of the community. That I very well understood, and understand that, while we're all trying to get good grades and learn, there's other things outside of the classroom.

I think that serving as an example to them of that being the case for me, who's in front of them would serve many purposes. One of them is to them realize that I'm also a human being, but also for them to hopefully relax a little bit and be able to really enjoy the content of the class, which is ultimately, for me, the point.

Frank Silva: Definitely. And you do the same in your lab, it sounds like.

Alex Chaim: Yes, 100%. Yes.

Frank Silva: I remember telling you, I said when I was a student professors like you didn't exist. It's really important because I do hear from our scholars that when a professor takes the time to humanize themselves and the course, that they feel like they belong. They feel like they can be in that classroom. Obviously, I think for those people who are listening, who identify as part of the Latino community seeing you there can be inspiring for them and then hearing your story that you a balanced human being. You have a family, you went to school and raise your family at the same time. I think it is very helpful. I wanted to thank you for doing that.

Alex Chaim: Thank you.

Frank Silva: The other thing is that you're very active in creating community here at UC San Diego, and you talked a little bit about CaSAS and BUMMP. Maybe you could tell us more about what CaSAS is, why did you start it?

Alex Chaim: Sure. CaSAS stands for community and science advancements in Spanish. It has a Spanish acronym on purpose because it's important that people familiarize themselves with it. But the whole idea behind CaSAS was that I realized and to start again from my own experience, I realized that after I moved to the US, while I would still speak Spanish with my family and people that I would meet that speak Spanish, I really stopped speaking scientific Spanish, even though I learned science in Spanish. I did my undergrad in Spanish.

Then I moved here and stopped. There were many reasons for that. One of them is that I was actually doing science in English so there was really no reason to do it in Spanish. But I realized that I had lost the capacity of speaking about my science in Spanish because I didn't even know

the words. A lot of things coalesce together, but UCSD in San Diego, in general, I feel like it's a place where maybe not exactly the way it happened to me, but in similar ways, many people speak Spanish, but they don't speak scientific Spanish, either because they learn it and they stop like me or because they never actually got a chance to learn it, or because they know it, but they don't have the stage to use it.

I just had the idea to start scientific seminar series in Spanish. I didn't really know how to go about it, but I got lucky on a student who's part of SACNAS, which is, I guess, a community of under represented minorities, including Latinos and Native Americans, thank you. He heard about it, and he mentioned it to a colleague of his, and she reached out to me, and she said, Alex, I hear about this. You need help. I would love to help you. I said, yes, that's what I need is help, please. She helped me set it up. Then, very organically, people have joined forces.

Actually, in the same room, every month, we meet and have two high level scientific seminars in Spanish. Everything is in Spanish, the presenter so again, trying to humanize science, the presenter their first slide is to speak a little bit about who they are and where they come from. They talk about their science, there's questions. Then at the end, we have a slide about what was the most fun and the hardest thing about putting together slides in Spanish. We have had, I think, around 26 of these already, so we've been going for over two years now. This room is usually filled up with people, which is great.

Obviously, it helps. We have always some sort of Latin food. We started doing a little bit of everything. Then we've settled on tacos for the most part. It's a safe space. You can tell people feel very comfortable, and people actually have reached out to me talking about how comfortable they realize they feel when they're doing something like this in their native language. But actually, I want to point out that it's not only native speakers. We have a huge range of people. Something that was important to me, too, is that many people that, for example, grew up in the US, in San Diego, speaking Spanish at home, then they go home and they don't have the words to talk about what they do here on a daily basis. I want to help change that.

I think this has been a great platform for that. Many people have actually brought their family members to CaSAS when they're talking or even when they're not. Many of them are able to go back and talk to them. Some have started some smaller outreach things in Spanish. It serves many, many purposes. You get to hear the accents from different parts of the world, the accents from different English speakers that are speaking in Spanish, some people that speak very little and still like to come and listen. We have some Portuguese speakers that also join. It's been great, honestly.

Frank Silva: It has been because that's something that I've often heard Latino doctoral students say, like I wish I could explain what I do to my parents. They're proud of me regardless, but I wish they really knew the details of what I do. So thank you for creating that opportunity to give the scholars the opportunity to practice that and to be able to bridge this knowledge between themselves and their families. You mentioned that the last slide is what people enjoyed. What are some of the common things that you hear?

Alex Chaim: The most common one is that I guess it's been going through the motion of actually doing it because they hadn't really put themselves in that setup. Many have said that the best thing was doing it, finding the words and being able to talk about it. But the exact same way they say that they say the hardest part was actually doing it. Most of us, I gave the first talk for CaSAS, I spent hours looking up terms and practicing to make sure that I actually could remember the term.

But I say that, and something really nice about CaSAS is that it's also a very laid back setup. If you come and you don't know a word no one's going to judge you. If anything people just say, do you know what the word is, and someone shouts it if they know what it is. Like someone else is like, I had no idea. Let me write that down. So it's very relaxed. Something that is also very unique is that we've really good audience at all levels. We have undergrads that come all the

way up to professors, some people from industry, grad students, postdocs, everything. People that don't come as often to CaSAS and they come to present, they're usually amazed by the amount of questions they get. They get questions from everyone at all different levels.

It's very nice to see how maybe students that wouldn't feel as comfortable asking questions a different setup, they really do. They ask very good questions and they have follow ups. Then usually when the talk is over, the students approach the speaker. We also have a huge contingent of students from Tijuana that come to listen to the talks. It really is a very nice mix of so many different things.

Frank Silva: You created something really beautiful on our campus.

Alex Chaim: Thank you. I enjoy it very much.

Frank Silva: That's nice. Whoever's listening, if they want to come to UC San Diego, this is something that they can participate in.

Alex Chaim: Absolutely. It's open to anyone. At least for now, it's always been the third Thursday of every month at 4:00 PM at Bonner Hall.

Frank Silva: Here in Bonner Hall.

Alex Chaim: Yeah. You can bring your family, and if you want to talk, you can also let us know, and we'll be happy to have you.

Frank Silva: Wonderful. What are the biggest takeaways you want students to leave your class and lab with?

Alex Chaim: Class and lab, I think, are very different places. For class, again, I teach a fairly large classroom that has a lot of content. It's cell biology, and you basically have 10 weeks to go through a lot of what's inside the cell. That's a lot. I honestly don't expect anyone to remember everything. I'm always fairly careful about how I phrases because I don't want them to check out and not really pay attention to anything, but I also don't want them to stress out so much about everything I'm throwing at them because I know it is a lot.

I also need to prepare for these lectures, and I know it is a lot. But what I want them to know is what's out there, so that if at any point they need the information, they know where they can look for it. Getting some general we talk a lot in the class about numbers and scales so they get, like an idea in their mind of the size of things and where they are, and roughly what they do. But the exact details, they're awesome, but It's not that important they remember them. It's just important they know they exist and that they're relevant and that the information is there for them to grab it if they need it.

The lab is very different. There's obviously a lot of what I just said. But in lab, there's many things. One of them is that you actually do need to learn a lot of very specific details that you do need to remember. But what is also very different in lab is that you fail all the time. I've talked about this in the past with many people, but it's interesting that this career that we choose is one where you're constantly failing, yet you keep going. Some of us live for that. I really enjoyed failing in the lab because I learned from those failures, but it's not for everyone.

I think spending time in the lab, the best thing you can learn is first, if this is for you, if you feel comfortable failing and trying again and iterating and innovating, and the other one is how to learn from those failures. I say failures, maybe that's not the right word because when an experiment doesn't work or doesn't work the way you expect it to work, that doesn't mean that it's not informative. I guess what I like people to learn in my lab is that they will fail a lot and then they should keep trying and that that's normal and that the most likely outcome is that it's not

going to work. If you understand that, you accept that and you like that, then this is absolutely the place for you.

Frank Silva: The concept of failure is part of what it is that a researcher does. I think it's really important, but it also gets to the humanizing aspect. Nobody's perfect, and science in and of itself is imperfect. That's just part of it. As we begin to wrap up our time together, what advice do you have for young scholars looking to pursue biology at UC San Diego?

Alex Chaim: Good question. UCC is a great place to do biology. One of the greatest benefits here is that it's a huge place. What that means is that you have access to so many different lines of research, so many different personalities, so much knowledge. At the same time, that makes it challenging for students. Because it means first that there's too many places where they can look for information, and sometimes they don't know what those are. But the second one is that there's many people like you that are probably trying to find opportunities.

Something that is common here is that students email professors looking for opportunities that they don't hear back. My recommendation to them is that they don't get this encouraged by that. It's very normal because we receive many, many emails. Many of us try to respond to all of those emails, but sometimes it's just impossible. Just keep trying because the most important thing you can do if you're interested in biology and research in particular, I'm happy to talk about the other things. But for research, to get early exposure to research by a good mentor is it's been shown that it's what makes a difference.

If you can get yourself into a lab and find a good mentor, it doesn't need to be a PI. It can be a postdoc, a grad student, an order undergrad. There's many, many opportunities that will make a huge difference in your life. So keep trying. There's many programs at UCSD that help you with that. For example, we talked a little bit about BUMMP. BUMMP is a great platform to actually help you find more maybe not research mentors yet, but a general biology mentor that can help you get to whatever it is that you want to do next. That can be finding a lab so they can help you with all of those things or even something as simple as just showing you the right place to look for what the opportunities are. So definitely take advantage of the opportunities that you have at UCSD because there's many.

Frank Silva: There definitely is. Thank you so much for your time. It's lovely speaking to you today.

Alex Chaim: Thank you. Same Frank. Thank you very much. [Music]