

Sara Suliman: Science is better when it's shared

Lucie Van Emmenis

Sara Suliman is an assistant professor in the Department of Experimental Medicine at the University of California, San Francisco (UCSF). Her lab uses multiple approaches to identify candidate tuberculosis (TB) risk pathways and to determine their role in TB progression. I caught up with Sara to talk about how she got interested in science, what she's currently working on, and what she thinks about the future of academic science.

First up, Sara, please tell us a little bit about yourself and how you first got interested in science.

I was born in Sudan, and when I was 2 my family moved to Saudi Arabia. Growing up in Saudi Arabia as a female, there's not a lot of representation of women, let alone women in science, so although I always thought that research was really cool and exciting, I just didn't know what that would look like. My family then gradually moved to Canada; I went there as an international student for my undergrad, biomedical sciences at the University of Guelph. I got the idea for a career in science there. Both of my parents were clinicians, and I was not interested in that lifestyle at all due to the long hours and it being very emotional, but I liked the science behind medicine.

What were your next steps?

I then joined a lab where I did routine molecular biology like cloning, DNA extractions, and PCRs. At this time, I started to see the link between doing lab work and public health applications. I was interested in both the public health aspect and the wet lab work, and so I did my honors project in a physiology lab, which exposed me to a completely different way of thinking. All of these things together just made me so excited about the idea of having a career in research. During the course of my PhD in T cell development and leukemogenesis under Professor Cynthia Guidos, I became less interested in cancer and cancer immunology and more interested in fundamental

immunology. I noticed that when I went to seminars I was a lot more excited about basic science or post-pathogen interactions. At the back of my mind, I still had public health as a guiding principle, and so I started a public health program before I finished my PhD. I then wanted to switch fields, and when I saw a TB postdoc position that came up in Cape Town, it was a perfect fit, as they were looking for a biologist with an immunology background. After these previous positions, I actually missed basic science. I met my mentor Professor D. Branch Moody in a conference in Australia where he interviewed me during a wine tasting! I became an instructor (junior faculty) at the end of 2019, and during the pandemic is when I realized that I actually do really like running a lab. I was given the opportunity to run a diagnostics evaluation lab for COVID-19, and I just really loved the management side of it, and working with the employees, and running the operation; it was a lot of fun! That's when I started thinking about faculty jobs more seriously, and then the opportunity came up at UCSF, and I got an interview, and now I'm here!

You mentioned that you also have a degree in public health; how do you feel that having that extra degree has helped you in your career?

I think that it helped hugely! I think that still to this day, we don't teach statistics in a formal way in experimental departments, which blows my mind! I think that the



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Master of Public Health (MPH) forced me to just sit down and learn biostats, and it gave me an introduction to programming. When I transitioned to Cape Town, it was perfect because I had to deal with human and population level data, which without having that public health context, I wouldn't have been able to navigate as easily. The MPH program is fairly broad, so some courses were not necessarily as relevant, but overall, I think the skill set was definitely complementary.

What are you working on in the lab at this moment, and what projects are you excited about?

The lab is moving in two very exciting directions! For the first one, the main question

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we are asking is what are the host risk factors that precipitate progression from exposure to mycobacteri TB to disease? We know that TB interferes with host tyrosine metabolism and we don't understand why, so we've been working in the lab on developing in vitro CRISPR models in primary and myeloid cells to experimentally validate that they have a role in infection and just broadly understanding the mechanisms of that. By interfering with the host metabolic state, we can see what's aiding disease progression, and the cool thing is that there are existing treatments that we think can be repurposed as treatments for TB. Obviously, there's a lot of pre-clinical work that we need to do as a proof of concept. The other exciting project that we're working on is the interaction between SARS-CoV-2 and TB; there is already quite a bit of literature suggesting that exposure to different viruses is a risk factor for progression to TB. Initially we designed the study to have a control non-SARS-CoV-2 exposed group. Then the Omicron wave happened and unfortunately we lost our control groups due to most of them being exposed to the new variant, so we pivoted and now we're studying the impact of long COVID on TB reactivation. We're in the operational phase of that project right now, so we are busy getting the human studies off the ground, which we are very excited about.

What was the most surprising thing about setting up your lab?

I'd heard a lot of horror stories, so it was surprising to me how easy it was! My division at UCSF has been phenomenal; they helped me to order equipment months before I had started, so my freezers were already set up and waiting for me when I joined. In addition, I was able to start the lab with people that I trust. When I was setting up my lab, the advice that everybody gave me was to hire slowly and hire well. I took this to heart and took my time with hiring. I tried to standardize the hiring process as much as possible, so I asked the people I interviewed to talk to me about what they've done before and why they need this job and where do they see themselves afterwards, and some people completely blew my mind with their answers! I've also taken on a lot of summer students. I ensured that they were in the lab for a longer period of time, so that the experience was not just

about training, but also for their own satisfaction to see how the projects they work on evolve, and so that they were able to see the results.

What are the qualities that you would like to foster in your lab that you have picked up over your time in science?

I like team science, although there can be tension between the individual contribution and the team contribution, and to be honest I'm still trying to figure that out. I talk about my science very openly; for me science is better when it's shared. This way you have people bouncing ideas off each other. I don't want to worry too much about being scooped. I think the cost benefit is definitely on the side of being collaborative and being open. What I really enjoy about UCSF is that it does have that open collaborative spirit, and people generally just want to talk about the science for the sake of talking about it, even if they are not formally involved. I've been in labs where people are more guarded, and I hate it—it's not my personality. I like to show the data to the person next to me and ask, "What do you think?" I think that's the culture that I'm trying to foster in my own lab. I want the lab to be open, while still recognizing that people need to feel that they have ownership over specific things and that they're the drivers, because I think that psychologically that's also very important.

I've seen that you belong to the Black in Immuno community. I was wondering how it feels to belong to a community like this and how it benefits you as a scientist.

Although I am not formally involved or a part of the Black in Immuno leadership, I think it's really cool that there are so many people in the community who are willing to do that work. Finding community like that made me feel proud that there's such a critical mass of us, and that we're thinking about the science and the intersectionality between the identity of being a scientist and our Black experiences. To have a place where we're not just upset and angry, but also celebrating and networking with each other. It's nice that now there are hubs where if I want to collaborate with people who are interested in specific questions, there's a resource of people who look like me that I can work with, which was hard to identify before. It's been very exciting and

very uplifting. It's also really great to be exposed to that much African-led research, and that's something that I want to continue supporting as I move forward as an African person in the diaspora, and I think that's really important for me.

Given the current debates that are happening in many spheres surrounding the role of postdocs and students, how do you feel about the future of academia?

I think there are two layers here. What's happening at UCSF, or the UC system, right now is amazing and I support it 100%, and the concerns are practical concerns that as faculty, we think about a lot. Having been a postdoc for seven years in two different countries and living through the same types of struggles, I can completely understand why a lot of people leave academia. There's also an additional layer of being on a visa, so I support the need for change 100%. I think there needs to be a real investment in academia. Talking about wages, this is a symptom of a much bigger problem, which is underfunding of academia and a general devaluation of what being an academic scientist actually means. What's happening now is allowing us to have these conversations about the role of academia, and we are finally addressing why we need more funding for academia. But ultimately, I feel hopeful. Maybe this is UCSF specific, but they did genuinely create a platform for more diverse faculty to join and to retain them and I have felt very supported here. There is an influx of fresh, new ideas of what academia should look like, and whilst diversity is only one layer, there's also thinking about what the role of academia in society is and how we can further that.

And finally, how do you spend your free time?

Firstly, I really like taking long walks multiple times a week to clear my mind. Particularly during the pandemic, it was very helpful. Now, though, I just like taking walks around the city. I think nature walks in general are very helpful to my soul. Secondly, I love live music! I recently saw Elton John, and he's been on my list for the longest time! I'm so glad that live music is coming back finally, and San Francisco is a beautiful place for it.