

PEOPLE & IDEAS

Irene Salinas: The joy of continuous growth and learning

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Irene Salinas is a professor in the Department of Biology, University of New Mexico. Her lab uses multiple animal models to study nasal immunity and neuroimmune interactions in the olfactory–central nervous system axis in response to microorganisms. We recently spoke with Irene about her current work, her diversity, equity, and inclusion (DEI) work, and how her leadership style has changed over the years.

Please tell us a little about yourself and how you first became interested in science.

I grew up in a household where both my parents were really educated; they were medical doctors with PhDs, so education was a big deal. I grew up having lunch with my dad watching videos of surgery of whatever he was learning at the time. I always saw that dichotomy of how both of my parents were MD PhDs, yet my mother was the one who stayed at home with us, didn't go to conferences, and had to sacrifice her career for the family. My dad did pioneering work in organ transplantation, and my mom juggled family duties while supporting his career. My mom is really amazing; she is a force, and definitely really hard working. I grew up in a very supportive family, and they always believed that you could achieve whatever you want to achieve, and I think that's something that I still carry with me. Science is so difficult in so many ways, but if you have an inner strength and foundation, and know who you are and what you want, you won't get lost in the process or get lost in failure. I carry my education very close to my heart, and my family is a big supporter of me, so I consider myself really privileged in that sense.

My childhood dream was to become a fish biologist because of all the fishing trips with my dad, but that changed during the last year of high school when I had a whole

month of immunology during my biology class and I became hooked! I realized I could blend my love for fish and immune systems, and that's been my focus ever since. Over the years I have moved away from the applied aquaculture/disease side and moved more into biomedical research, asking many more fundamental questions about immunology and using fish as a model system. After getting my PhD in Spain, I did two postdocs—one in the U.S. and another in New Zealand, where my husband had always wanted to live. Coming back to the U.S. wasn't initially on my radar due to feeling burnout from science, but when the opportunity in New Mexico came up, it felt like the perfect mix of great science and staying true to who I am in terms of my hobbies and my love of outdoor adventures. I feel incredibly lucky to have found a career that lets me do what I love while exploring new places with my family, and lucky to have been able to apply for this job!

Did you always want to be a group leader and run your own lab?

I have always been the kind of person who lives in the moment, so I have never done any thinking about whether this is what I need to do for the future. I didn't even think about tenure or Ivy League institutions or any of these things, which I think in a way was good for me because it took pressure off from the whole system, and in retrospect, I think it allowed me



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to not get burnt out. Sometimes I think that American PIs [principal investigators] are burned out already from their PhDs or from postdocs. I was just enjoying my life and where it was taking me. I really love science, and so to be working in science, traveling the world, and meeting great people (I love meeting people from all over the world!) was great. It wasn't my goal in life to be a leader, so in a way I am curious how it happened for me!

What are you currently working on, and what projects are you most excited about?

In our lab, we're deeply engaged in comparative evolutionary immunology, exploring a

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diverse array of models and projects. One area of significant focus involves neuroimmunology and the gut-brain axis. Specifically, we're delving into how viruses modulate sensory neurons in the olfactory system and their subsequent immune responses, unraveling the communication between the olfactory nerve and the brain—an area surprisingly understudied in immune protection.

Another intriguing project, currently under review, centers on the discovery of a microbiome in fish brains. Over the past 5 years, we've been rigorously sequencing brain microbiomes to understand their role in brain function and the intriguing symbiotic relationship between fish and brain bacteria.

Lastly, we're pioneering research on skin immunity in African lungfish, a remarkable species capable of living outside water for extended periods. This project explores how the immune system contributes to the formation of protective cocoons and the underlying mechanisms of skin regeneration. We're particularly excited about the potential applications of our findings in regenerative medicine, collaborating with partners to explore therapeutic possibilities for various inflammatory diseases using human organoids. Currently, we're focused on isolating and characterizing stem cells from lungfish skin—a critical step in unraveling the intricate dialogue between the immune system and stem cells during regeneration.

Aside from the work happening in your own lab, is there any other work that you're excited about within your field?

In neuroimmunology, I'm particularly intrigued by recent breakthroughs in basic neuroscience. There was a remarkable study in *C. elegans* just before Christmas that challenged conventional wisdom about neuronal communication (Randi et al., 2023). Instead of focusing solely on synaptic transmission, the study revealed the prevalence of communication through dense core vesicles containing neuropeptides, particularly outside the synapse. This finding has profound implications for understanding how neurons interact, especially in the context of neuroimmunology. Considering my research on nerve damage, this alternative mode of communication offers a compelling framework for exploring immune system recruitment along nerves. I'm excited about bridging principles

from basic neuroscience to advance our understanding of neuroimmunology.

I follow you on X (formerly known as Twitter), and it's great to see some of the work that you are involved in, particularly within the sphere of diversity, equity, and inclusion (DEI), and it's clear that this is something that you are very passionate about. I wanted to ask if you had any advice for scientists at any stage of their career if they were looking to get more involved in this type of work. How would you recommend someone start to be involved in this type of advocacy?

That is a really good question. Reflecting on my journey, I've learned the importance of both passion and strategy. It's crucial to delineate a plan, identifying what issues resonate most and setting meaningful, achievable goals. However, these endeavors must also bring personal fulfillment and make you happy. Simply addressing issues just because they appear pressing means that you risk getting burned out. Viewing advocacy as a marathon, not a sprint, ensures that you remain engaged. It's also essential to align these efforts with your identity as a scientist, and avoid obligations imposed by others. I began this work during the transition to full professorship, and it's vital to navigate the risk of being pigeonholed into the DEI box without compromising scholarly respect. Finding this balance is key, and the truth is that we are still a long way from being sufficiently recognized for those efforts.

Your perspective on finding joy in this type of work is so refreshing; being able to find joy and meaning in your work is clearly very important.

Absolutely. Joy is the backbone of sustainability in any endeavor. In the realm of DEI, opportunities abound for enriching experiences. Organizing initiatives like "Black in Immunology" not only connected me with brilliant young scientists but also provided invaluable insight into their perspectives and technological fluency. Similarly, community outreach in New Mexico offers the chance to interact with underprivileged youth, bridging gaps and making a tangible impact. When our efforts bring us joy and fulfillment, they become enduring and meaningful.

In general, do you feel that attitudes and practices within academia are changing and improving because of the recent increased spotlight on DEI initiatives? Do you feel that there is noticeable momentum toward improvement?

I think there is definitely a noticeable shift, especially among the new generation of graduate students and postdocs. They're more outspoken and informed about DEI matters and unafraid to advocate for change. However, I still feel that there are a lot of people who simply talk about or claim DEI engagement without tangible action or a structured plan for change. Institutions play a pivotal role in DEI work; when DEI efforts become integral to workload, performance reviews, and tenure considerations, real progress can happen. Currently, DEI work often feels like an addendum, lacking recognition or reward commensurate with its importance. For instance, during my recent promotion, there was no designated space in the dossier for DEI contributions. I had to include it as an appendix, hoping it would be acknowledged. While some progress is evident, there's a pressing need for institutionalization to prevent DEI efforts from becoming an additional burden on already overburdened academics.

This year at JEM we are focusing on women in STEM. We have heard about mentorship, the need for parity between men and women, and ways in which labs can promote healthy working environments. I'm interested to know if there are specific strategies within your lab aimed at fostering inclusivity, or perhaps initiatives at your university or elsewhere that you find noteworthy.

Absolutely. In our department, we've taken deliberate steps to address gender imbalances, particularly during faculty searches. Without such intentional efforts, the status quo will persist. Progress has been made though, and the number of women in our department has increased by about double since I joined.

Within my lab, we implement individualized mentoring plans, tailored to each person's needs. Over the years, I've observed a common lack of confidence among women, including white and minority women. I strive to support them in gaining confidence and advocating for themselves.

This includes providing leadership training and resources for conflict resolution and mentorship. While I've had supportive male mentors, I've become a resource for female trainees seeking advice on balancing career and family.

Maintaining an open-door policy and being vulnerable about my own challenges fosters trust and openness among my students. There's immense pressure to excel in every aspect of life, particularly for women, but I believe in authenticity and transparency in leadership.

What are the things that you most enjoy about your role as a group leader?

I think over the years what I have realized is that the thing I love the most is how much I'm learning from the people I work with. We are supposed to be the ones who teach them, but the truth is that I'm becoming a better mentor and I'm becoming a better scientist, I'm learning all of these new techniques, all of these new questions, I'm doing things that I never thought I was going

to be doing thanks to the fact that my trainees are pushing me to do that. I never thought that that was going to be my job as a PI; I thought, "I'm the one who needs to always give them the information, teach them everything," but I've pushed myself to being so different from who I was as a postdoc and who I was as a scientist 12 years ago. I think that that's the best thing; I can always see growth in me as a person, as a mentor, as a scientist. You can always get better, and it also never stops! You can always write better, you can always ask better questions, you can always execute experiments better, but that's coming from the people who I work with. And I love that message for whoever you are as a PhD student, as a postdoc—that doesn't define you forever. I love the idea that you're changing, and you can openly say, "I've changed because I've learned from all these different people I admire." When I started, I was not a good mentor; how I mentored my first PhD student is completely different to how I do it now, and that's a good thing!

Being a leader is such a learning curve, and I love the idea that as a person, and a scientist, you are constantly evolving and gathering new skills and people in your network who can support you. For the final question, a more lighthearted one to end on: while not in the lab, how do you enjoy spending your time?

Exercising! I love hiking, climbing, and camping with my family. We have a van with beds inside and then we have a pop-up tent for my 8- and 4-year-old on the roof, and we just drive around the Southwest exploring and traveling. I love cooking a lot as well. I'm a manual person, I guess; I like involving my body in everything I do. Every week I make all of our meals, all of our bread, all of our muffins—everything! Hopefully once the kids are a bit older, I'll have more time for cooking. And I'm a foodie; I love going out to nice restaurants!

References

Randi, F., et al. 2023. *Nature*. <https://doi.org/10.1038/s41586-023-06683-4>