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VIEWPOINT

Women in STEM becoming independent: Embrace failures as part of the journey to success

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This year at *JEM*, we are highlighting women in science by sharing their stories and amplifying their voices. In this Viewpoint, we hear from a cross section of women, across multiple research fields, discussing their science and the process of setting up a lab as an independent researcher. As well as being able to celebrate the positives of becoming an independent researcher, we would also like to use this platform to discuss the unique challenges they face as women scientists in their respective scientific environments. This Viewpoint is part of an ongoing series at *JEM*.

Zhoujie Ding
Senior Research Fellow, Department of Immunology, School of Translational Medicine, Monash University, Melbourne, Australia

I am a senior research fellow co-leading a National Health and Medical Research Council (NHMRC)–funded project at the Immune Memory Laboratory, investigating how plasma cell lifespan is regulated in health and disease. After completing my PhD at Uppsala University in Sweden in 2015 and taking 2 years of parental leave, I secured a Swedish Research Council International Postdoc Grant and subsequently relocated to Monash University in Melbourne in 2018. The transition proved challenging, particularly with young children and expensive childcare. Support from family, former and current colleagues, and my partner was key in helping me eventually settle in the new environment after the first year.

Government funding for research is highly competitive in Australia, and there is no academic tenure-track system, complicating the career path toward independence. To overcome these obstacles, mentorship is essential. With the support of my postdoc supervisor and mentor, I started to apply for funding after obtaining my Australian permanent residency in 2021, and we were awarded a successful NHMRC grant in 2023, marking a significant milestone in my career trajectory.

Moving countries between training can be undeniably stressful; therefore, being prepared to re-establish a supportive network from scratch is necessary. Nonetheless, a new environment offers fresh inspiration and broadens the academic horizon, both of which are vital elements in the pursuit of independence in academia.

Nicola Laura Diny
Junior Group Leader, Institute of Clinical Chemistry and Clinical Pharmacology, University Hospital Bonn, Bonn, Germany

I'm an immunologist studying eosinophils and their interactions within tissues. Last year, I started a new position as junior group leader at the University of Bonn. I spent many years abroad, moving to the U.S. for my PhD and to the U.K. for my postdoc. This international experience was fantastic, but posed a challenge when I decided to move back to Germany. With my scientific network abroad, I lacked local connections and an understanding of the intricacies of the academic system, funding landscape and research culture. The postdoc-to-PI [principal investigator] program at the Francis Crick Institute was a great preparation for the application process and interviews but couldn't prepare me for the demands of the new role. I found that support from the new host department is crucial to make relevant connections and identify opportunities. My advice would be to actively seek out mentors. I am looking forward to growing my lab, mentoring junior scientists, and discovering more about eosinophils.

Rebecca Gentek
Principal Investigator, Institute for Regeneration and Repair, Centre for Reproductive Health and Centre for Inflammation Research, University of Edinburgh, Edinburgh, UK

My lab in Edinburgh studies how the immune system develops in normal and adverse conditions.

I got hooked on science through my high school biology teacher, who let me independently conceive and carry out a small research project. That was it: I wanted to be a scientist.

After that, I never considered an alternative career path, even if at first I had little idea what it actually entails. Following my undergraduate degree at home (Germany), I moved for my PhD (Netherlands), postdoc (France), and most recently to the U.K. Although moving was encouraged, I also very much *wanted* to live abroad. It has been a very rich experience, even if not always easy. Starting a lab whilst settling into a new country in a global pandemic certainly had its challenges!

Although I still find it hard to put into practice, I was advised to "find my own path" as a scientist. To me, this path is best shared with friends, and I would not have made it through the first independent years without peer support.

Shiri Gur-Cohen
Assistant Professor, Department of Medicine in the Division of Regenerative Medicine, University of California San Diego, San Diego, CA, USA

Growing up, I learned to work hard and be proactive thanks to my mom, who always said that "doors never open by themselves." Today, I am an assistant professor at the University of California, San Diego, a U.S. immigrant, and a first-generation graduate among my extended family.

In 2022, I established my research lab, where my team and I study stem cell adaptations to systemic stressors over our lifespan. I am fascinated by how cues transmitted through our vascular system at multiple length scales shape the stem cell phenotypic landscape. Through my work, I aim to accelerate tissue fitness and eliminate cancer as a life-threatening disease.

Being a scientist and leading my own laboratory has been a lifelong dream. It allows me to experience the true meaning of leadership and the responsibility for the well-being and scientific fate of many individuals. I am deeply proud that I have developed an innovative research program that simultaneously seeks to advance regenerative medicine and address inequities in biomedical research and training. One of the most rewarding aspects of my job is witnessing the scientific growth of my lab members. I enjoy nurturing them in all aspects of their thinking, and I'm excited to see them make great scientific choices in the future.

Throughout my career, I have learned that alone, I cannot accomplish anything. Science is collaborative, and I enjoy sharing my research and working with brilliant people. This collective spirit allows us to troubleshoot more efficiently and challenge established dogmas to advance our knowledge. Establishing a lab can be very lonely. Moving from a shared space teeming with people to an office-centered role was a significant challenge. Expanding my supportive network has allowed me not only to seek help from those around me, but to expand my lab's work and collaborate across disciplines. The best advice I can give is to voice your ideas, always keep trying, surround yourself with amazing people, pay a favor forward, and embrace failures as part of the journey to success.

Motoko Y. Kimura
Professor, Department of Experimental Immunology, Graduate School of Medicine, Chiba University, Chiba, Japan

I am an immunologist focusing on T cell biology. My lab studies how T cells discriminate between self and non-self to respond against non-self antigens such as pathogens to mount appropriate immune response, and to self-components to maintain tissue and immune homeostasis. I started my lab in 2021, when my daughter was just 8 months old. It has been a big challenge for me to be a new PI and a new mom all at once. However, I chose both and am now confident that this was the right decision, even though there were many obstacles in the way. I often tell myself, "Be brave! Enjoy everything and learn from all experiences!" I think there are two important keys. The first one is "connecting with people." Nothing could be achieved without the people around me. I deeply appreciate my team members, my mentors, my colleagues, and of course, my family. The second one is "curiosity and passion." My motivation comes from the joy of discovering new life phenomena. I am sure that I will face many challenges ahead, but these two keys will help me on my thrilling journey.

Fern Koay
Team Leader, Peter Doherty Institute for Infection and Immunity, University of Melbourne, Melbourne, Australia

I am a Malaysian immunologist working in the University of Melbourne, specializing on unconventional, innate-like T lymphocytes. We study the development and function of these non-peptide reactive T cells, and with my team we aim to harness these unconventional cells to unlock their immunotherapeutic potential. Through my personal observations, the (current) path to becoming an independent PI in Australia can differ from other countries. The Australian research landscape is smaller relative to more populous developed countries, in terms of research institutions and limited funding mainly stemming from two national funding bodies, the NHMRC and Australian Research Council. This presents unique challenges compared to the U.S., U.K., or European countries, where direct routes, support mechanisms, and opportunities to reach independence can be more obvious through established tenure-track and permanent position pathways (e.g., K99, Wellcome Trust and Medical Research Council, CNRS/INSERM, etc.). Thus, it is not uncommon in Australia to lead a sub-group under a senior PI. Such structures enabled me to lead senior-author studies; secure initial grants as chief investigator; and effectively direct, mentor, and fund the research of my group while leveraging mentorship. The best anecdote emerging from my peer network is that despite bespoke paths and timelines, we face and embrace similar critical learning curves that profoundly shape our careers. Though the path to independence might seem expedited elsewhere, the key ingredients to running successful research teams often converge: (i) time and effort to build a respectable track record and profile, (ii) a robust team and collaborative network, and (iii) highly supportive mentors and peers. These elements have been crucial in many aspects of my career trajectory as I continue to contribute, lead, and meaningfully nurture the passion of our trainees to advance the field's research.

Giuliana Magri
Ramón y Cajal Investigator, Immunology Unit, Biomedicine Department, Faculty of Medicine and Health Sciences (Campus Clinic), University of Barcelona, Barcelona, Spain

I am an immunologist at the University of Barcelona, where I study the role of humoral immunity in host–microbiota interaction and infection. I established my laboratory last year after obtaining a tenure-track contract from the Spanish government. The transition to independence has been relatively smooth, as I already earned my first grants as a PI during the later stages of my postdoc. This provided me with the opportunity to gain experience in managing funds and recruiting and mentoring trainees in a familiar environment. During this period, I also realized the importance of having supportive collaborators. In essence, I learned how to lead a laboratory and define the type of mentor I aspire to be. Yet, succeeding as a young PI in an academic institution in Spain still requires resilience and persistence, as we have to navigate bureaucracy and deal with limited funds. Nonetheless, leading a laboratory is also greatly rewarding, and for me, the most fulfilling aspect is witnessing your trainees grow and develop into successful scientists. My advice to trainees aiming to become independent is to surround yourselves with a supportive community and not let rejections or setbacks get you down, as they are an integral part of the journey. Just keep doing great science!

Araceli Perez-Lopez
Assistant Professor, Unidad de Investigacion en Biomedicina, Facultad de Estudios Superiores Iztacala, Universidad Nacional Autonoma de Mexico, Estado de Mexico, Mexico

I am an immunologist and microbiologist; my research group focuses on the study of host–microbe interactions and the host immune response in the context of acute and chronic inflammation. I am a first-generation college graduate, and becoming a PI has been a long journey. Since I was in elementary school, I was interested in human biology, and when I took my biology and chemistry classes in middle school, I knew I wanted to be a scientist. I did my graduate school in Mexico, moved to the U.S. for my postdoctoral training, and came back to Mexico to stablish my independent research group in 2020. Beyond starting my own laboratory amid the COVID-19 pandemic, becoming independent in Mexico has been challenging because the research infrastructure is less robust than in the U.S.; however, having a community made up primarily of other young PIs helped me to navigate these differences. One of the best pieces of advice I received when I decided to pursue a career in academia is to be wise when choosing my mentors. I was very fortunate to have great mentors in many ways; they gave me the tools to become an independent scientist, and now that I have my own group, I try to mirror them. Being a new PI is like being on a roller coaster, with ups and downs, but always with the opportunity to learn something new every day. Lastly, I would like to say that becoming an independent PI would not have been possible without all the support of my family and friends.

Natalia Barbara Pikor
Assistant Professor of Neuroimmunology, Institute of Microbiology, ETH Zurich, Zurich, Switzerland; Group Leader of Neuroimmunology, Medical Research Center, Cantonal Hospital St. Gallen, St. Gallen, Switzerland

I am an assistant professor at the ETH Zurich and group leader at the Cantonal Hospital in St. Gallen, Switzerland. My lab studies the mechanisms by which fibroblasts shape immune responses in the central nervous system and its associated lymphoid organs. My journey toward academic independence was initiated after receiving competitive career grants from the Swiss National Science Foundation as well as a prestigious professorship. The first years of starting your group are transformative in terms of developing a leadership style; you foster the skills needed to run a lab—project management, communication, and conveying a passion for and rational approach to research. Taking responsibility for projects and trainees can be challenging at times, but bringing projects to fruition, being the first to understand new aspects of immunology, and taking that journey together with your trainees is thrilling! The best advice that I received when starting my group was to focus on obtainable and productive projects to secure the opportunity to realize my long-term scientific vision.

Lauren B. Rodda
Assistant Professor, Department of Molecular Microbiology and Immunology, Oregon Health & Science University, Portland, OR, USA

I am an assistant professor in the Department of Molecular Microbiology and Immunology at Oregon Health & Science University in Portland, OR, USA. My lab studies the contribution of tissue resident memory B cells to respiratory tract barrier immunity. Starting the lab has been surprising and overwhelming, but all on the backdrop of the joy of joining a community of excited, rigorous scientists. My colleagues of all career stages have been wonderfully generous with their time and advice. Several have agreed to be on my formal mentoring committee for the next 4 years and have already been instrumental in my getting set up and navigating this new institution. Their suggestions have sometimes been quite different. The advice I'd like to pass on is to connect with the mentors who have created aspects of the successful lab you are imagining and weigh heavily the advice from junior faculty who struggled with the same challenges you are currently navigating. If that is ever me, please reach out!