

Laura Mackay: Don't be afraid to engage

 Lucie Van Emmenis¹ 

Laura Mackay is a professor and Immunology Theme Leader at the Doherty Institute at the University of Melbourne. Her lab investigates memory T cells, including their development, the role tissue-resident memory T cells play in cancer, autoimmune diseases, and barrier immunity, as well as ways in which these cells may be used therapeutically to treat various pathologies. We spoke to Laura about the importance of speaking up (and encouraging others to do so), gaining confidence in your career, and her uncommon introduction to science.

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

I was born in the UK, and science wasn't really on my radar growing up—I wanted to be an artist. My mum, also an artist, encouraged me to choose a "sensible" degree at university as a fallback, and I ended up studying biology. I wasn't fully engaged in the early stages, but that shifted in my final year when I came down with glandular fever. Trying to understand what was happening led me down a rabbit hole of reading about viruses and the immune system. This ultimately steered me toward a PhD studying the immune response to EBV with Alan Rickinson at the University of Birmingham. That's when I really fell in love with research.

Tell us about your career trajectory, and what led you to becoming a group leader.

Becoming a group leader wasn't something I initially aspired to—I loved being in the lab. It's such a creative space, where you get to ask questions, solve problems, and follow ideas in real time. I started applying for grants and fellowships to support the research I was excited about, and having technical help meant things could move faster. As the projects grew, so did the team, and I found myself in a leadership role. Leadership hasn't always come naturally, and it's something I have to work at. I'm too much of a people pleaser, and it's a big responsibility to mentor others—and I take

that seriously. But it's incredibly rewarding to build a team and work together toward shared goals. I've been fortunate to collaborate with, and learn from, some brilliant people—many of whom have become close friends.

My role as Immunology Theme Leader at the Doherty Institute evolved from a similar trajectory—being engaged in the research culture and wanting to support others across the immunology community. It wasn't a position I chased, but it felt like a natural next step.

What does success look like in this role to you?

Seeing people in the team thrive—whether that's making a discovery, gaining confidence, or moving on to something they're excited about. For me, it's also about staying genuinely curious, doing good science, and contributing to something bigger than just your own work.

How did you first become interested in working in the immunology field and specifically tissue-resident T cells?

At the end of my PhD, where I studied T cell responses to EBV, I was keen to move into mouse models to ask more fundamental questions about memory T cell development. I attended the Viral Immunity Keystone Symposia in 2007 with the idea of approaching a T cell-focused lab head in the US. But that plan changed when I heard Frank Carbone from the University of



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Melbourne present unpublished work on T cell persistence in the dorsal root ganglia and skin.

At the time, most memory T cell research centered on circulating cells, especially in the context of lymphocytic choriomeningitis virus (LCMV). Frank's lab had developed mouse models to study something different—how T cells persist in peripheral tissues—and I was immediately drawn to that. After his talk, I asked him about a postdoc position in Melbourne. Sometimes you just have to take the leap.

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

We're focused on how T cells develop and function within different tissues, across a range of contexts—from cancer to

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autoimmunity. I'm particularly interested in how intrinsic cues, like TCR specificity, intersect with external factors, such as hormones, the microbiota, and local cell interactions to shape tissue immunity. It's about trying to piece together the full picture of what makes immune responses effective—or dysfunctional—at barrier sites.

Please tell us about some work in your field that you are currently interested in.

I think spatial omics will transform the field of barrier immunity as the technology becomes more accessible. It's a big step up from the four-color flow cytometry I used during my postdoc, and while the complexity may drive us crazy, I'm excited to see the field move beyond studying individual cell types, viewing immune cells and other tissue components as part of an integrated system.

When you first became a group leader, how did you gain confidence in your new role, and was the transition to independence easy to achieve?

It wasn't an overnight shift—learning to balance science with management and mentoring took time. I've come to see

leadership less as having all the answers and more as creating an environment where others can do their best work.

What are some of the qualities that you learned during your graduate studies or postdoc that you maintain and foster in your own lab?

"Don't be a wallflower" was advice from my PhD mentor, and it stuck. I used to be fairly reserved (a very British trait), but every time I've pushed myself to speak up or step outside my comfort zone, it has led to something positive. It's something I encourage in my lab: be curious, ask questions, and don't be afraid to engage.

Mentorship in science is extremely important; what are some qualities that students and postdocs should look for in potential mentors?

Mentorship has been central to my career. I was lucky to have mentors like Frank Carbone and Bill Heath, who were open about everything they didn't know—genuinely curious and generous with their thinking. That created a space where it felt safe to ask questions and challenge ideas. When thinking about a potential mentor, it's worth asking whether you feel comfortable speaking

openly. If it's hard to have an honest conversation, it can be difficult to get the most out of the relationship.

Where do you find inspiration for your work, and what motivates you as a group leader?

Honestly, I dream about it—some of the most useful ideas come when I'm not consciously thinking about work. I'm driven by how much we still do not know; it's like a never-ending jigsaw puzzle, and I need to understand how the pieces fit. I'm always turning things over in my head, looking for what we've missed or could do better. As a group leader, the science keeps me engaged, but it is the team that keeps things moving. Being part of the discovery process is what I enjoy most.

While not in the lab, how do you like to spend your time, or alternatively, how would you like to spend your time?

I love to travel and see new places, especially if there's food involved. Pilates helps me get out of my head, as does managing an absurd number of plants—I've basically gone from managing mouse to plant colonies. Also, Korean drama—I need subtitles to keep me off my phone and a high level of drama to stay interested.