Roslyn Kemp

In our latest interview, we had the privilege of sitting down with Professor Roslyn Kemp, a distinguished immunologist and educator. Known as “Ros,” she shared her insights into nurturing the next generation of scientists.

Ros is a Professor of Immunology at the University of Otago, Otakou Whakaihu Waka, New Zealand, and is a member of the Maurice Wilkins Centre for Molecular Biodiscovery. She investigates molecular signalling pathways in T cells and their role in immune responses to tumours and inflammatory bowel disease. Professor Kemp was awarded the Miriam Dell Award for Science Mentoring in 2015. She also recently co-

authored the book “How to Be a Scientist: Critical Thinking in the Life Sciences.”

Ros is a driving force at the International Union of Immunological Societies (IUIS). She is on the IUIS Council and serves as Vice Chair of many committees; namely the IUIS Education Committee, the Gender Equity Committee, and the Publications Committee. Most importantly to Immunopaedia, Ros is Chair of the IUIS EDU Online Subcommittee, which oversees Immunopaedia pre-course content.

What sparked your interest in immunology?

I went to university to study physics and chemistry, but a timetable clash sent me into a Microbiology and Immunology course. I was inspired by one lecturer, Glenn Buchan, who talked so passionately about how immunology could change the lives of millions of people, and I was hooked from then.

Your research investigates T cells and tumour immunity. How do molecular signalling pathways in T cells contribute to immune responses in patients with colorectal cancer and inflammatory bowel diseases?

I have been researching T cells my whole career, so I have a massive bias about T cells controlling everything. Our lab looks at individual patients and studies the composition of their T cell responses – their phenotype function and how they stay alive and respond to external signals – and we relate that immune signature to the clinical status of each patient. Our goal is to change how treatment decisions are made, and how clinical trials work – each person is unique, and immunology doesn’t work if you try and average it out. We believe that T cell signatures can show who will respond to what therapy, and we are working on bioinformatics and visualisation tools to make this information accessible to clinicians.

Congratulations on your book! What motivated you and Deborah

M. Brown to write “How to Be a Scientist: Critical Thinking in the Life Sciences”?

My teaching philosophy is not to teach science but to teach students to become scientists. There were lots of books about science content, but not many explaining to undergrads how the science system really works – how does publishing work? How do people get grants? What sort of jobs can graduates get? How should scientists think about bias or statistics? Deb and I were postdocs together 20 years ago and have remained good friends, and both of us are champions for quality education. It was a natural partnership and having a co-author made the process of writing it so much more effective and fun.

How does the book guide undergraduate students in understanding scientific research, critical analysis, and practical skills?

The book is designed for undergraduates, but it was clear through the COVID pandemic that basic science literacy is lacking in the general population, especially in terms of understanding data and evidence. We wanted our undergraduates to understand how science works and be able to explain and advocate for science in the community.

The book takes the reader through all aspects of the scientific process, from coming up with an idea to finding funding, presenting results, analysing data, and interpreting the data. We have included both individual and class exercises so they can be easily incorporated into undergraduate teaching. We also recognise that many graduates are anxious about their future, so we highlight potential jobs and also focus on the “soft” skills that come with a science degree. We hope the book excites our students and teaches them all the good stuff about doing a science degree.

You received the Miriam Dell Award for Excellence in Science Mentoring, could you share your approach to mentoring young

scientists?

Mentoring is really difficult because each individual has their perspectives and views on what worked for them or what advice they can provide. The award was partly based on a mentoring database that I established for the ASI – the idea was to try and partner like-minded people together and focus much more on personalities and career goals than on research area. Relationships are the most important thing with mentoring – young scientists need someone they can trust as well as respect, and ideally, mentoring goes both ways, with mentors learning from their mentees too. My lab is encouraged to do a lot of peer mentoring too – people can be so well supported by others at a similar stage in their journey and those relationships also rely on trust – the idea that all of our research is important and that we work together to achieve the lab and everyone's individual goals.

As the Vice Chair of the IUIS Education Committee, could you share your vision for immunology education in the evolving teaching landscape?

I think that the increased connectivity between researchers, students and teachers recently is a great opportunity for collaborative learning. We have so many tools available to work together and to cross-pollinate ideas. This approach parallels beautifully with immunology, which is so complex and interconnected. Students studying immunology need to be able to change positions and incorporate new and often conflicting information, and the best way to do that is via discussion – with their peers, their teachers, and people outside immunology. I would like to see immunology educators adapt to encourage discussion and critical thinking and move away from a content-instruction model.

Are there any upcoming initiatives or projects within the IUIS Education Committee that you are particularly excited about?

I very much like a focus on incorporating new technologies and existing datasets into individual research projects. In the last 5-10 years, I have seen two types of talks at international conferences – one is from people (like me) with limited funding and the other is from people with extremely well-funded labs, who can do 10-million-dollar experiments. Rather than competing at such a disparate level, the availability of datasets to all, generated from those who can afford to do these experiments is essential to capitalise on the brains of all those researchers out there who can think about immunology but can't always do the experiments they want to. The IUIS Education Committee is incorporating technology- and data-based online and in-person courses which will give early career researchers the essential skills to keep their creativity and ideas and use data generated by others, but not be hampered by the lack of funds.

As the Head of the Online Subcommittee (OLSC), what strategies will you employ to ensure the effectiveness of online pre-courses?

I am very new in this role and still learning what has and has not worked well in the past. I want to make sure that successful approaches are retained and that new approaches are supported. We can integrate critical analysis skills into the pre-course material – encouraging students to share ideas and critique each other in a safe and supportive space and teach them that it takes a team to develop a great research idea. Using new platforms to communicate the content, including case studies, videos, collaborative projects, and interactive exercises, will facilitate this approach.

How do you envision the future of immunology education, especially in terms of online learning and global collaboration?

Education must be protected from the current disparities in research funding. We need to provide as much education as we

can to as many people as we can, in an effective way – this means addressing the most relevant problems, identifying the best approaches to teaching and research, and recognising that these will differ for different audiences. We are at risk of drowning in online materials, so effective curation and the ability to direct students to the relevant content and type of content will be key for successful teaching.

What advice do you have for aspiring researchers or teachers who want to make a positive impact in the field of immunology?

Talk to as many people as you can and talk about anything. My postdoctoral supervisor, Dick Dutton, designed a research project from an idea he got looking at a puddle on his morning walk. Some of my best teaching approaches have been learnt from educators teaching the building trades or working at the Department of Corrections. You never know what quality support and information is out there until you talk to people.

Interview by Bonamy Holtak