

CELL SCIENTISTS TO WATCH

Victoria Cowling

Victoria Cowling received her BA from the University of Cambridge. She completed her PhD with Julian Downward and Gerard Evan at Cancer Research UK in London, and then moved to the US for a postdoctoral position at Princeton University and Dartmouth College with Michael Cole. Since 2008, she has been running a lab at Dundee University. She is an MRC Senior Research Fellow, a Lister Institute Research Fellow and an EMBO Young Investigator and, in 2015, she was the first recipient of the Women in Cell Biology medal, awarded by the British Society for Cell Biology.

What does it mean to you to be the first person to receive the Women in Cell Biology medal?

It's brilliant. I was totally shocked when I got the e-mail because there are a lot of very good young cell biologists in the UK at the moment. Most people said "congratulations", but a few people said they didn't agree with women-only awards. That led to more discussions about the number of women who are group leaders and professors, even within my own institution – so, a positive thing from that perspective.

What first motivated you to become a scientist?

I'm not from a science background. My parents, my family, weren't in science. When I was younger I enjoyed all the science programmes on TV. I used to read books by Oliver Sacks, which have a good intersection between science and real life. But I was really more interested in physical sciences until I went to work at AstraZeneca when I was 15 and at school. I really enjoyed the combination of seriously important biological research questions, bench work, theory and the discussions. Working there was a really big turning point.

Your research focuses on the synthesis, function and biology of the mRNA methyl cap; what are the specific questions that your group is currently trying to answer?

The key questions are: how does the cell use the capping enzymes to cause changes in gene expression in response to external stimuli? At the moment we're very interested in stem-cell differentiation and T-cell activation. Equally important is asking whether we should be inhibiting these enzymes therapeutically to target cancer cells and parasites.

Are there different mRNA methyl caps and different capping enzymes?

It turns out there is a significant number of 'flavours' of cap, if you like. The different enzymes cause different modifications. The research really changed dramatically when we moved away from cancer cell lines. They were very useful, but once we started



working with primary cells we saw a vast amount of regulation that we hadn't seen in cancer cells.

What sort of cell biology methods do you use and, of those, which one would you say is the trickiest and most problematic?

We give ourselves a hard time by using any technique we need to. At the minute we're in three new tricky areas that we haven't ever worked in before – structural biology, stem-cell biology and T-cell biology. There are a huge number of challenges there, getting to grips with new techniques and new ways of thinking, and new ways of describing our work.

Are there any new techniques that you are thinking of adapting for your research?

Not new techniques, but techniques new to us. Structural biology, T-cell immunology and stem-cell biology are very new to us. I hope to move our research more into embryos soon; so, again, that will be a new series of experiments.

How and when did you establish your collaborations? What advice on collaborating would you give to people?

We've always been lucky to get the right collaborators. When I started my lab, we weren't really collaborating with anybody, we were just working by ourselves – which I think was the right thing to do at the time. But there's no way we could now work in all these different areas if we didn't have the collaborators in place. I think it's probably been quite important that we've established an identity as a lab before carrying out too many collaborations. Now, that we've built up a bank of knowledge in the capping area, the collaborations have come quite naturally with people who work in complementary areas. I think you can over-collaborate – you can end up being a help to too many people! You can start a collaboration with just a few experiments but, eventually, you need somebody in the lab who is taking care of that collaboration.

Victoria Cowling is a group leader at the Department of Life Sciences, University of Dundee, UK. She studies the biology of the mRNA methyl cap.

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Early-career scientists often find that the advice given by senior scientists on how to establish a successful academic career can be outdated in the current funding climate. As someone who has established their lab relatively recently, what advice would you give?

I think research funding and the way research is being done have changed dramatically over the last 20 years. It’s getting tougher and tougher to get funding. You have to be quite practical about it – the first thing to do is to decide what you want to work on. It should be unique and interesting, yet still significant within cell biology or animal physiology, and you want to convince people that you’re the person to do it. Certainly there is a huge element of risk and there doesn’t seem to be enough funding such that everybody who starts their career continues. I think that’s unfortunate.

You have to really stick to doing what you want to do, as well. That might sound obvious but, so many times when you start a lab, people try to give you advice. They mean well, but I think you ultimately have to maintain a balance between listening to advice and sticking to what *you* want to do. Doing some projects that are following on from your postdoc work and then, at the same time,

doing some new projects is probably a good idea. Ultimately, you want to be publishing papers quickly. But then it is a good idea to move away from your postdoc research. Unless you’re the best in the world at it, which, typically, you’re not!

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Do you think taking time to participate in science outreach activities should be more of a priority for scientists?

My research is funded entirely by taxpayers or people giving money to charities, so it is very important that I explain our research to the public. I try to do one activity per year. But my priority is research, publishing and getting more funding and, therefore, I do restrict how much I do any other activity.

You moved to the US for your postdoc and then returned to the UK to start your own group in Dundee. What challenges did you face when moving to a different country?

The hardest thing about moving is leaving friends and family behind. Once you have moved, you realise how important these people are for your mental health! There are also some interesting practical challenges – in America, I struggled with the sweetness of most foods – and finding a washing powder that I could work with!

What are the biggest challenges that you faced so far?

I had two children during the time I started my lab – Evie and Julia, now 3 and 6 years old. So, I started in 2008 and I had my first child in 2009, and the next one in 2011. That meant suddenly going from working 13 hours a day in the lab to working very restricted hours and looking after children all night as well.

That must have been very hard...

It still is. I still struggle with whether I am giving them enough attention. I feel like I’m stretching myself too thin most of the time. But I do like the fact that my daughters have a mother who has a career, and they wouldn’t imagine that that isn’t a possibility for them. My older daughter wants to be a scientist of dinosaurs and bodies and planets! You know, lots of girls don’t think that science is even on the cards for them, so that’s a positive step.

Video interview

An additional, short video interview with Victoria is also available, and can be viewed directly here: <http://jcs.biologists.org/lookup/suppl/doi:10.1242/jcs.176693/-/DC1> or on the JCS Interviews page: <http://jcs.biologists.org/site/collection/interviews.xhtml>.

Victoria Cowling was interviewed by Anna Bobrowska, Editorial Intern at *Journal of Cell Science*. This piece has been edited and condensed with approval from the interviewee.