

CELL SCIENTISTS TO WATCH

Paul Conduit

Paul Conduit was a research assistant in John Kilmartin's lab at the MRC/LMB in Cambridge, UK, before beginning his PhD in 2006 with Jordan Raff. In 2010 he moved with Jordan from the Gurdon Institute in Cambridge to the University of Oxford, where he continued his work as a postdoctoral fellow. Paul is now a Sir Henry Dale Wellcome Fellow at the University of Cambridge and has been a group leader at the Department of Zoology since April 2015. His lab studies microtubule nucleation from both centrosomes and from other microtubule-organising centres in the cell.

What motivated you to become a scientist?

When I was growing up, I was interested in biology but I really wanted to be a footballer. That obviously didn't work out. So after my undergraduate biology degree, I wanted to see what the world of science was like and applied for a research assistant position. My preconception of lab-based science was that everyone was a bit of a nerd, no one had any fun and it would be very boring. In fact, it was the complete opposite; the science was very interesting and I met a lot of very nice people, enjoying what they do and having a lot of fun at the same time. It was then that I knew I wanted to be a scientist and, after two years of working as a research assistant, I applied for a PhD.

During your PhD and postdoc you worked on how centrosomes assemble in *Drosophila*. What are the questions you're going to focus on now?

I'm trying to change tack a little bit and direct my research into understanding how microtubules are formed. They form from centrosomes, especially during mitosis, but they also form in many other places in the cell. Microtubules are absolutely essential, but centrosomes not necessarily so. I think it's really important to understand how microtubules form at all these different places (including centrosomes). Thus, I'll have a link to my old work, which was focused on how centrosomes are able to recruit the complexes that allow microtubule formation, known as γ -tubulin ring complexes, but will also look at how these complexes are recruited to other sites.

Are you interested in the signalling that determines where these γ -tubulin ring complexes assemble or in the specifics of how they assemble?

I'm mainly interested in how they assemble and how they are recruited to different places. They're multi-protein complexes. There are some core components that we now know form a ring that acts as a template for a new microtubule. But there are additional components that people thought were doing something in one place



in the complex, and it's just now becoming clear that they might actually be somewhere else, doing something else. It opens up the possibility that different individual complexes might contain different combinations of these proteins, and this might help to determine where these complexes go.

One main question we need to figure out: are γ -tubulin ring complexes all the same or do they vary and does that affect where they're recruited and therefore where microtubules are made?

What kind of cell biology methods have you used or are you planning to use?

We'll be doing a lot of genetics and microscopy. With *Drosophila* it's very easy to manipulate the genome, especially with the advent of CRISPR. We want to use live-cell microscopy to look at a range of cell types with a variety of genetic backgrounds. One can often learn much more from looking in living cells than from looking at one fixed picture.

Would that be on cells in culture, larvae or embryos?

We plan to look at several cell types, but all *in vivo*. One exciting possibility is to look at dendritic arborisation neurons in larvae. They're really close to the cortex, and you can image them directly through the larval wall.

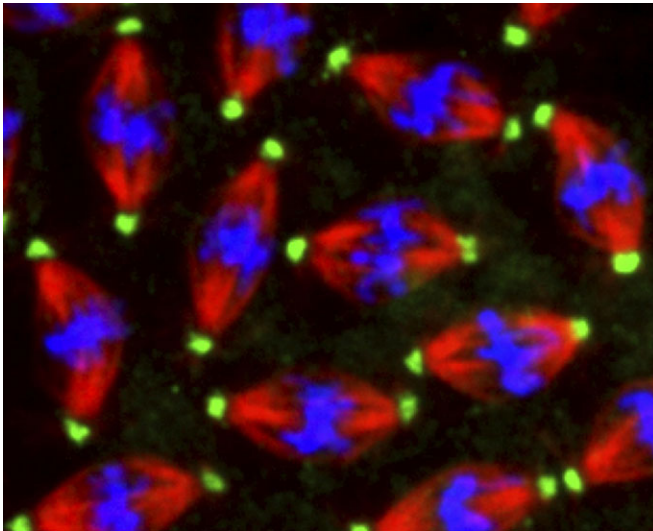
“...you benefit much more from talking to people, even outside the lab.”

How did you establish collaborations and what advice on forming collaborations would you give to someone who is planning to start their own lab?

My major collaborations were actually with people in the lab. We would combine our skill sets and it made for a much better story. My advice is to be as open as possible about your research, certainly within the lab environment. You should always discuss with your

Paul Conduit is a group leader at the Department of Zoology, University of Cambridge, UK. He works on γ -tubulin ring complexes.

e-mail: ptc29@cam.ac.uk



***Drosophila* syncytial embryos in metaphase of the cell cycle.** Multiple microtubule-based spindles (red) are preparing to separate the duplicated chromosomes (blue) and are organised by centrosomes (green) that are located at each spindle pole.

colleagues what you're doing; they can give important feedback and there are possibilities for collaborations within the lab. In this day and age, the best papers often use a mix of techniques.

I don't like this idea of people not wanting to discuss their work because they're worried about being scooped. I think you benefit much more from talking to people, even outside the lab.

As someone who has just established their own lab, what other advice would you give?

Think about things early, as early as possible, because often the career development fellowships all have limits in terms of how many years after your PhD you'll be able to apply for them. But if you find yourself slightly out of the time limit, you should contact the funding body because there is flexibility. They told me that directly.

The second thing would be, if you're thinking of applying for a career development fellowship, you want to make yourself distinct from the lab you've come from. Definitely find yourself a niche to work on.

The other advice would be about the application process. Read the advice given about how to write a grant. How you write your

grant matters just as much as what the science in the grant is (unfortunately!).

Lastly, if you're rejected, try not to take it personally and keep trying. I've experienced it and seen it a lot, and it's tough to take. But I think it's normally due to a lack of resources rather than a lack of good science, which is a huge shame.

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What kind of challenges have you faced starting your own lab that you didn't expect?

Well, there've been lots of challenges. The first was getting the grant, and that was quite a scary situation due to family reasons. We moved from Oxford to Cambridge before I knew I was going to get a grant. I'd left my postdoc position, so it was a risk.

The next challenge was that I wasn't moving into a pre-arranged space, so there were lots of negotiations about where I was going to be. The space that has now been assigned was not originally set up for the kind of experiments that I want to do. It now has to be completely refurbished, and I had to draw up plans for the lab, which I have never done before, so that took a lot of investigative work.

At the beginning of the interview I asked you what inspired you to become a scientist in the first place. What motivates you now?

My main motivation is that I enjoy what I do. If I didn't enjoy it, then there's no way I would want to be doing it, because it's a lot of hard work. I'm now also motivated by the idea of being able to help other scientists establish themselves. I quite like the idea of providing space and money for people to do research and to hopefully watch them go on to flourish as scientists.

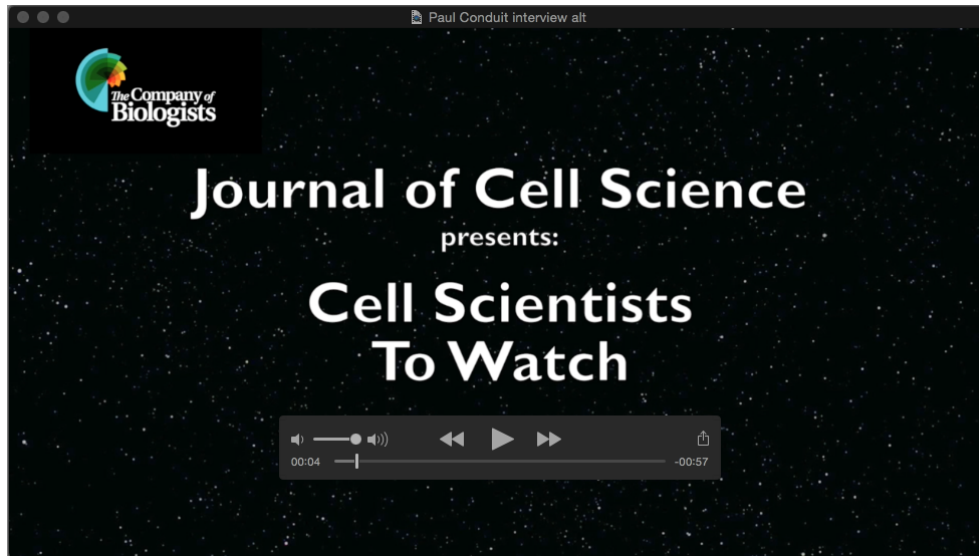
Can you tell me an interesting fact about yourself that people wouldn't know just by looking at your CV?

After university I was very tempted to go into the police. But I was obviously also very interested in biology and I thought: if I go into the police now, I can't go back. So I should try science first. I always have it in the back of my mind that if things don't work out in science, I'll apply to the police.

Video interview

An additional, short video interview with Paul is also available, and can be viewed directly here: <http://jcs.biologists.org/lookup/suppl/doi:10.1242/jcs.175059/-/DC1> or on the JCS Interviews page: <http://jcs.biologists.org/site/collection/interviews.xhtml>.

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



Video Interview Short