

Cell Scientist to Watch – Sophie Acton

Sophie Acton received her Master of Pharmacology from the University of Bath, UK, and subsequently started her PhD in the laboratory of Erik Sahai at Cancer Research UK London Research Institute and University College London to study the motility of cancer cells *in vivo*. In 2008, Sophie moved to her postdoctoral position as a Henry Wellcome fellow at the Dana-Farber Cancer Institute and Harvard Medical School, USA, under supervision of Shannon Turley, followed by a second postdoc with Caetano Reis e Sousa at the Cancer Research UK London Research Institute. She established her own research group in 2016 as a Cancer Research UK Career Development Fellow at the MRC laboratory for Molecular Cell Biology (LMCB), University College London. Her research is focussed on the interaction of dendritic cells and fibroblastic reticular cells during lymph node remodelling in the adaptive immune response.

What inspired you to become a scientist?

I never truly made a decision of ‘this is what I want to do’ in my early career – I just followed what I enjoyed doing at each step when I had to make a choice and this is where I ended up. Neither of my parents went to university. My mum was a primary school teacher and my dad worked in business. Both are retired now, and I think they are still somewhat confused by my career trajectory. I’m very curious by nature and I like to follow my own questions so I suppose that’s why I’ve ended up in academia, naturally.

During your studies in Bath, you spent one year at Millennium Pharmaceuticals for your placement in industry. Did you ever consider industry for your career path?

I went into the placement open minded and I started my degree thinking that I wanted to do drug development and bring new medicines to people, but when I worked in industry I found it very constraining. I worked with a lot of very smart, very interesting people and enjoyed that year, but I knew that I wouldn’t fit very well within that sector. I think academia is a much more creative space and it comes down to personality, really. With a research group, I can follow my own interests – so long as they are fundable. In industry, that is not the case, so it wasn’t for me. My goals were different.

After a PhD in cancer biology, you moved into the field of immunology for your postdoctoral research. Was this a big transition for you?

I was working on mechanisms of cell migration and cytoskeletal dynamics, and that just happened to be in the context of metastasis for my PhD project. I enjoyed studying how cells moved and communicated with each other, and it just felt like a very natural step to understand the cell biology of those same questions in a different context to find some independence. The immune system seemed like the perfect place to take some of those cell biology ideas and training that I had from my PhD. They may sound like very disparate things, but I went from studying mechanisms of cellular metastasis



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in a cytoskeletal context to understanding how dendritic cells moved and trafficked, again, in a cytoskeletal context, so it was not such a big jump for me. I think taking something you know very well and are passionate about to a different context is a great way to find your own niche in the long term.

What questions are your lab trying to answer just now?

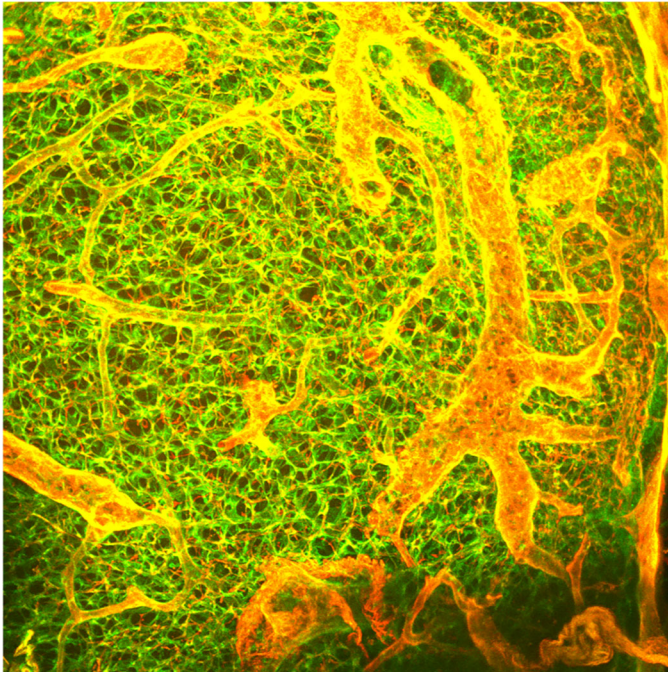
In the context and sphere of tissue biology – both in cancer and in normal immune responses – we are interested in understanding how lymphoid tissue remodels. How is it possible that our lymph nodes expand and change and have that fully reversible function? It wouldn’t be possible for other tissues to grow and shrink and to change so dramatically without damage. That’s a fundamental and very interesting question for me, and there are different ways that we’re approaching it. Many of the same cell interactions are also happening in tumour micro-environments, although in a more chaotic way, so a lot of what we hope to understand in normal physiology in lymphoid tissue in immune responses is also applicable to certain aspects of understanding cancer micro-environments. So that is our take on how we take normal physiology to something clinically relevant in the longer term.

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What are the methods you are using and are there any new techniques that you’re adapting for your research right now?

We still use a lot of microscopy compared to some more classical immunology labs. I like to be able to see what is happening. We image deep into tissues, keeping everything in the spatial context as

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3D reconstruction of lymph node tissue. The image shows a fibroblastic reticular cell network and blood vessel structures (podoplanin in green, and collagen IV in red).

much as possible. We do intravital imaging so that we can see cells moving live in their tissues; we also use tissue sectioning, live tissue slices – where we can image live or we can fix and get really good resolution deep tissue sections – to understand how cells are connected to each other and how the tissue architecture is formed.

Are you still doing experiments yourself?

The lab has grown quite quickly, so it's actually been quite a long time since I did a whole experiment myself. I still really enjoy the microscopy and where it's helpful, I will come and join somebody whilst they're doing their image acquisition and we can discuss how best to get the most from that imaging session. I do like those hands-on hours here and there, but I do much less at the bench than I expected I would just three years into running the lab.

What has been the most influential publication or work in your field recently?

Very recently, I've seen a preprint manuscript (bioRxiv 833509) by Uli van Andrian's team and they have shown that the lymph node tissue is directly innervated. They can see nerve fibres and they can see transcriptional changes in the stromal cells of the lymph node response to innervation, and I find that extremely exciting. It's a step away from the niche we're working in, but I think in the longer term the interactions between different systems – immunology with the nervous system for example – are going to bring some exciting new advances to immunology. I would say that is the most influential paper I've read in the last few weeks and should move the field on hugely.

What are your views on the advent of preprints in the life sciences?

It's not something that I used as a PhD student or a postdoc – it wasn't commonly used. Now, it is extremely helpful to see what people are doing and we also get fantastic feedback on our preprints. It doesn't look like there's a lot of feedback going on because no one

comments on the preprint servers, but I've had several people who I've approached and said 'we've got this paper ready' and I've had full email comments as if it was officially peer reviewed, but offline and independent. Thus, by the time we submit our paper to a journal for peer review, I feel that it has already been improved by the community.

What challenges did you face when starting your own lab that you didn't expect?

Very small things that I had underappreciated my previous group leaders having to deal with – things like the number of emails and the increased number of meetings that you face. They really challenged my multitasking – I still constantly double book myself for meetings and I have to send apologetic emails to say 'I'm sorry I'm not there, I'm somewhere else and that's my mistake'. It's taken me 3 years to get used to that different way of working. It's not something that I was trained for; I don't think anyone is trained for it.

What is the best science-related advice you ever received?

Everyone who I've worked with previously is still a very key mentor to me but I was also given a mentor through Cancer Research UK and she is a businesswoman – now retired. We met two or three times over the course of the first year through a programme called 'women of influence' and she gave me so much good practical advice on how to deal with meetings, how to manage people and projects, how to organise a schedule – all the small things that I had no idea how to do but she was an absolute expert in. A lot of those things I continue to do today; she was absolutely invaluable and I was very lucky to be part of that programme.

How are the challenges that you're facing now different?

Yes, I feel much more in control than I did 2 years ago. We have nice stories coming together from the projects that we have started in the lab. Our PhD students are now up to speed with all their techniques and are making good progress on their projects. It feels like we're in a good flow, but at the same time you can't enjoy that and sit back because a career development fellowship is short; next year I need to be preparing and submitting senior fellowship applications. We're in a sweet spot right now, but the next grant deadline is already looming.

In 2019, you published a survey among newly appointed group leaders. What is the most important point you learned from this study and what advice would you give to someone about to start their own lab?

I would say that the most important thing about transitioning to independence is to find other people who are your new peer group; people who just started their labs or about to start their labs, other senior postdocs, so you can talk to each other and have as much transparency in the process as possible. Talk details with one another and support each other; that level of transparency is really what the published survey is about (<https://doi.org/10.7554/eLife.46827.001>). You're on your own unless you go and seek out people who are doing the same thing. They don't need to be in your building even but you do need support from people who are going through the same thing that you are at the same time.

Looking at the survey's results, there are disparities in starting salaries and teaching load. Support from peers should help to address this before you start your lab, right?

We can be very naïve as new starters – we just don't know what to ask for or what to get in writing. By publishing these data, we hope

that it will at least give you some talking points for your new line manager or head of department to know if you're being paid at an equivalent rate to others in your field or similar positions or fellowships; asking to see which lab space you would be working in is not something that I asked when I was interviewing, but it's an easy question and somebody recruiting you should have thought about it. Hopefully now the next round of postdocs who are looking to become independent group leaders, they can look through some of those statistics that we published and know what they should be expecting.

What is your advice on establishing good collaborations?

I would really recommend collaborating with other new group leaders. I found that everybody in my peer group has been amazingly generous and really smart. By teaming up together rather than working alongside very senior labs, it's actually a very equal partnership and you both really benefit. I've found that really rewarding and have made some really great friends along the way by doing that.

How do you get the most out of the meetings you attend, particularly in the early stages of your career?

I think it's really important to be well networked as a postdoc and maybe even a PhD student if you want to be in academia long term. I think I was quite lucky and able to travel to quite a lot of conferences through my training, so I did know a lot of people in the field and also in my previous field in cancer biology. It is important to start networking really early – before you're an independent group leader, people should know who you are and what you're interested in.

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You're active on Twitter; where do you see the value in social media for science and scientists?

I think it's extremely helpful as somebody new to share your science, to connect with each other. I've been invited to speak at

conferences after conversations on Twitter. It's an extra level of networking, which is beneficial when you're new and trying to get established and make a name for yourself. I didn't know what Twitter was and I was strongly recommended to make a lab Twitter account when we started the lab and now I think it's great – you can follow things at a conference you can't be at, you get highlights of the latest papers, you see things on bioRxiv... I think it's a fantastic forum for science.

How do you achieve a work–life balance when you're trying to establish yourself as an independent investigator?

Obviously, don't bring work home if it's stressing you out – you need some time to relax. I don't mind replying to emails out of hours or working late at night for a grant deadline here and there, I just don't make a habit of doing that every weekend. I really enjoy the flexibility of an academic work–life balance. I can take time off to go to my kid's school events without asking anyone's permission or feeling guilty about it at all, and I can log in and do my emails in the evening if that suits me better. I think the flexibility that we have as academics is hugely freeing. No-one can tell you what pattern works for you, and I've found a pattern that works for me.

Could you tell us an interesting fact about yourself that people wouldn't know by looking at your CV?

I'm not very good at focussing and working for long periods of time, which is perhaps surprising because we have a lot to do. I was always the student who would annoy everybody I was living with because I couldn't sit down for more than 10 minutes to learn something and I'm the same now with writing. Over the years, I've learnt to appreciate that that's just how I work and when I do sit and do something it's going to be in short bursts. So, don't give yourself a hard time about not being able to sit for 8 hours and crank out 10,000 words in one go.

Sophie Acton was interviewed by Manuel Breuer, Features & Reviews Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.