

INTERVIEW

Transitions in development – an interview with Salah Elias

Seema Grewal^{*,‡}

Salah Elias is Associate Professor in Developmental Biology at The University of Southampton, UK. His research aims to understand the mechanisms underlying oriented cell divisions in the mammary gland, focusing on how these divisions influence epithelial differentiation and architecture, and how their dysregulation can lead to malignant transformation. Salah set up his research group back in 2017 and has since been involved in various initiatives, including the 'New PIs in Cell and Developmental Biology' forum and activities relating to Equality, Diversity and Inclusion. We chatted with Salah over Zoom to find out more about his career and his transition to becoming an independent group leader.

Let's start at the beginning: when and how did you first become interested in science?

I've been interested in science my entire life. I didn't grow up in a scientific environment or have any scientists in my family. However, I was fortunate to have spent most of my childhood in a beautiful place in the north of Algeria, situated between the Atlas Mountains and the Mediterranean Sea. Our village was surrounded by typical Mediterranean trees and had great biodiversity. As a child, I used to spend entire days with my friends in the woods looking for wild edible plants – this was our thing. And we were very good at finding them. We would identify them based on many criteria, such as the shape of their leaves, their colour or the place where they grew, and we really enjoyed discovering new species. My mother was very enthusiastic about our 'scientific expeditions', and she helped us a lot; actually, I would say she was my first mentor. I'm pretty sure that this is how I learned the scientific method and how to think like a scientist.

I was also very fortunate to have inspiring teachers in high school who went beyond the curriculum to help us discover the world from our little village. We used to have an after-school science club, where our science teacher would project documentaries. I remember in one session our teacher asked whether we agreed with one idea that the climate was the key determinant for human civilization, and whether we thought that some parts of the world were underdeveloped simply because they were too hot. I argued that this was not true, because the Egyptian civilization had thrived in the desert for centuries, and I will never forget the look on the face of my teacher after my answer! I think that was when I also began to understand the power of scientific facts.

How did you become interested in cell and developmental biology in particular?

During my time at school, I developed a passion for mathematics, natural science and philosophy. I used to read books about key figures in science and was fascinated by their ability to combine these



disciplines to advance scientific knowledge; I really wanted to be like them. I obtained my baccalaureate in science and, because I got a really high grade, my teachers advised me to do medicine because apparently it was the 'best' career path for me – it would bring me lots of money and solve all our financial problems. So I studied medicine for three years in Algeria. But I think those years were the most boring years of my life! I was so frustrated because I couldn't realise my dream of becoming a scientist. At that time, there were very limited opportunities for a career in research in Algeria, so I made the decision to go back to France (where I was born) and study biology. I returned to my hometown of Rouen in Normandy, where I discovered a whole new world. I was a foreigner and a first generation in higher education, and I really didn't know how to navigate the academic environment. I was also exposed to racism and discrimination for the first time, and I soon realised that I would have to work harder to realise my dream. But I was very lucky: I had a physiology teacher who thought I was good, and she offered me a summer research project. During this project, I carried out my first experiments using *Xenopus* embryos, and I discovered the power of imaging and what this could teach us about mechanisms of development. After this experience, I think my fate was sealed: I wanted to become a cell and developmental biologist.

You continued your graduate studies and postdoctoral training in France before moving to the UK – what spurred this decision?

After my undergraduate studies, I did a PhD in neuroscience, where I studied the mechanisms regulating the biogenesis of

[‡]Senior Editor, Development

^{*}Author for correspondence (s.grewal@biologists.com)

secretory vesicles in neuroendocrine cells. I had a fantastic mentor – Youssef Anouar – who also came from North Africa. He was an inspirational scientist, but also a great mentor who supported me and advocated for me throughout my PhD training. I was keen to pursue a career in neuroscience so I got a postdoc position in the lab of Sandrine Humbert at the Curie Institute in Paris. This was one of the best neurobiology labs in the world, so it was a fantastic opportunity, but actually the project I worked on was completely different from my research interests at that time. Sandrine asked me to develop a new project to look at the role that the Huntingtin protein plays in mammary gland development. The field of mammary gland development was obviously new to me, but Sandrine was a great mentor and helped me to develop the project. She also gave me the freedom to explore my own ideas and helped me to connect with key people in the field. This is how we built up a very exciting project in mammary developmental biology.

I continued the project as a post-doc in Liz Robertson's lab in Oxford. This wasn't the obvious choice because Liz didn't really work on the mammary gland at that time. But I knew Liz was (and still is!) one of the greatest developmental biologists that we've ever had. It was actually quite intimidating to go to her lab, but I soon discovered that Liz is not only a great scientist but is one of the most humble people you could ever meet. She supported me and allowed me to pursue my own research in mammary stem cell biology. She also played an essential role in my transition to independence. I remember going into her office, just one year after I had started there, and telling her that I wanted to apply for PI positions. I was quite scared about telling her this – I was worried about being disloyal – but Liz said, 'This is amazing!'. She assured me that she would support me and give me whatever I needed, and she has been a fantastic mentor ever since. We had many discussions at the animal facility, while we were setting up our experiments, about my career aspirations and my ideas. Liz also helped me learn how to write a successful grant application. She always believed in my ideas and encouraged me to pursue them. Importantly, she also inspired me by setting a great example of how science can be conducted with humanity and humility.

What were your most important considerations when you were looking for group leader positions?

I was looking for a place that would allow me to do my research and develop my own ideas. Having seen how things worked in Oxford, which really was a collaborative and supportive environment, I was looking for a 'middle-sized' department; I was not interested in huge institutes. I also inquired lots about the administrative support in the various places I applied to because I knew how important it was. Places that had core facilities that are centrally managed were also attractive options for me, as I knew I would be doing lots of animal work so having a good animal facility with technical support, together with shared spaces and equipment, would be essential as I set up my own group. These were the key elements that I looked for.

But one other thing that I also looked at was the department's approach to Equality, Diversity and Inclusion (EDI). The job advert for the position at the School of Biological Sciences in Southampton had some very clear statements about EDI, and it was evident that EDI was a central element in everything that they've been doing in terms of both education and research. This was something that was important to me and, I feel, is key to solving many problems in academia. Knowing

that the School really cared about EDI helped me to make my decision.

And how was the transition to becoming a group leader?

It was everything that I was looking for! I had been given the opportunity to set up my own lab and develop my own ideas, so it was an exciting time for me. It came with many challenges, of course. It was especially tough at the beginning, when I was trying to navigate the sheer number of tasks I had to do – teaching, admin, committees and research. It involved lots of multitasking.

But perhaps the most challenging part was just sitting in my office, in front of my computer, trying to find the best way to translate all my ideas into a grant proposal. I was alone and I was lonely. As a postdoc, I used to rely on my PI and I didn't have to worry about grants or money (and actually I realised how fortunate I had been to be in labs that didn't have any financial issues). But now I had to apply for grants and convince my peers that my ideas were sound and novel. But then I finally succeeded in getting those initial grants. Lots of this was thanks to our department, because we have a great coaching and mentoring culture. We have an internal process where colleagues can review your grant proposal and provide feedback, and then we have what we call 'grant forums' where we talk about our ideas. This is where you get the harshest comments on your grants, but you learn how to refine and develop them in order to make them successful.

But perhaps the most challenging part was just sitting in my office, in front of my computer, trying to find the best way to translate all my ideas into a grant proposal. I was alone and I was lonely.

What are the main research themes and aims of your group at the moment?

Our research brings together expertise from cell and developmental biology, as well as physics and mathematics, to investigate mechanisms of oriented cell divisions (OCDs) in the normal mammary epithelium and determine how they influence cell fate and dynamics during development and homeostasis. OCDs are crucial for the formation and maintenance of structured epithelia, yet their functional requirement in mammary epithelial biology remains subject to deliberation. This is a fundamental and important question for my lab, particularly in the mammary gland where tissue turnover is very high. There is increasing evidence linking dysregulation of OCDs to breast cancer, and my lab aims to understand how such OCD dysregulation can lead to epithelial malignant transformation. Our multidisciplinary approach has allowed us to make new discoveries, develop a set of cutting-edge tools, and generate novel ideas that open up new research directions and help us establish our own niche.

What has been your approach for hiring new team members?

I think this is one of the most important parts of my job and the most challenging thing that I do as a PI. I always seek to hire good people; I guess I care more about the human aspect as I believe that the rest, such as technical skills, can be learned. I think it is important to have people who care about the lab, and who are willing to work for the community and collaborate with their peers. We spend a large part of our time at work so it is important to have a

healthy environment where we support each other and work towards a common goal.

EDI is also a central element in my approach to hiring people. I spend a lot of time reading applications to make sure that I haven't let anything affect the fairness of my decision. I focus a lot on the potential of candidates: I always try to imagine what they might have achieved if they had had better opportunities or been in better places. During candidate interviews, I also remind myself and the panel that confidence does not necessarily mean competence. We're making decisions that can change people's lives, so we need to be serious, fair and unbiased when we make these decisions.

We're making decisions that can change people's lives, so we need to be serious, fair and unbiased when we make these decisions

I understand that you're also involved in your School's EDI committee – can you tell us more about your experience in this role?

I took on the role of Chair of the School of Biosciences EDI committee in 2019. I remember responding within minutes to the 'Expression of interest' call as I was so keen to get involved. The School had recently been awarded an Athena SWAN Silver Award, which recognises and celebrates good practice towards the advancement of gender equality. My challenge was to lead and implement an EDI action plan to ensure that we could renew our Silver Award. But I have been trying to go beyond simple legal compliance and we've developed some very important initiatives. For example, we organised open discussions and workshops about bullying and harassment – topics that are still considered taboo subjects. In addition to this, we have been developing initiatives to make EDI a central element in everything that we do, from research through to our approach to education. For instance, we now offer EDI training to postgrad students, as part of their induction. We are also designing EDI learning material that will be part of a mandatory training course for all first-year undergrads starting from next year. We really want to challenge students about questions surrounding unconscious bias and 'merit'. For example, if you're from a group that accumulated handicaps throughout the centuries, how can you compete with a group that accumulated privilege in parallel? We want to teach students that merit needs to be seen in a more open-minded way, and that being aware of this and learning about EDI is important for their professional and personal development. Finally, we have also been focusing on mental health and have devised initiatives that have been rolled out across our university to support mental health, particularly during the COVID 19 pandemic.

It really has been a team effort though. I was fortunate to have the support of the committee, particularly our Head of School – Lindy Holden-Dye – who is a real role model. She has an outstanding track record of promoting women in science and equality more broadly, and she has been very supportive of all our initiatives.

It's clear that you think good mentorship is very important – you've talked about how it helped you – but what are your thoughts on how we should approach mentorship?

There are many ways to approach mentorship but the underlying aim should be ensuring equity and making sure that everyone has the same opportunities. We all have our own stories – this is what

makes us who we are, and this is what makes us unique – but I think it is this diversity that we should embrace to achieve excellence in academia. There are different levels of mentoring, and everyone has something they can offer. For instance, I can talk about mentoring for under-represented minorities – I can talk about my own experience of how I grew up with the idea that I'm not as good as the majority, because I'd been told that, and how I had key mentors throughout my career who believed in me and gave me life-changing opportunities. Other people may have their own experiences that they can share to help others. It is this diversity of ideas and thoughts that can lift everything that we do in academia. Mentorship needs to build on the idea of diversity so that we can cultivate a culture where people cooperate instead of spending their lives competing. Peer mentoring – between undergrads, between postgrads and between early career researchers (ECRs) – is also powerful so we need to break the hierarchy in mentorship and make it more horizontal and straightforward.

The Academy of Medical Sciences has developed a system in which they have a database of mentors who can help you with different things, whether it's getting grants or dealing with tricky situations, and you can choose your mentor based on their expertise. This is what we have developed here in our School. We now have a number of mentors who can offer help on core themes, such as maternity leave, caring leave, mental health and wellbeing, and living and working abroad. By doing this, we can make sure that opportunities and advice are equally available.

What advice would you give to people starting their own labs?

The first thing I would suggest is to believe in your own ideas. If you've made it to that point, it's because you're amazing and your ideas are amazing. You just need to find the best way to translate them and to convince people how good they are.

You also need to remember the fact that you're not alone. Seek support when you need it – there will always be people who are willing to help, mentor and coach you. When you're applying for jobs, choose your department or institute carefully based on this. You might spend decades in one place so you need to find the perfect fit and an environment where you feel comfortable and supported. Finally, one other thing that I've learned as a new PI, and that we don't talk a lot about, is that when you get your start-up package, you need to spend it as fast as you can! There's a temptation to save it or extend it/carry it forward but you need to spend it so that you can generate the results that will then allow you to get the bigger grants.

Mentorship needs to build on the idea of diversity so that we can cultivate a culture where people cooperate instead of spending their lives competing

You've been involved in setting up the 'New PIs in Cell and Developmental Biology' forum on Twitter (@NewPICellDev) – can you tell us more about this?

This is a forum that I initiated with Bethan Lloyd-Lewis from the University of Bristol who is also a new PI. During the pandemic, we started to feel a little bit left behind and disconnected from our science peers; many of the networking opportunities that would usually be available to new PIs were no longer available due to travel restrictions. We therefore decided to create an online seminar series

where we could invite new PIs to speak. But then, after talking about it a bit more, we started to think bigger and thought that what we needed was a network and forum that could promote peer support and collaboration amongst new PIs. So we contacted more people, invited some speakers, set the programme and began to advertise. We got a huge and positive response from around the world and things really took off. We now have a group of over 150 PIs and labs around the world, all of whom are outstanding scientists – the future leaders in cell and developmental biology. The online seminar series is successful and we again have a full programme for the year. We are also developing new ideas about grant forums, where we can discuss and collaborate on grants.

We also recently secured a grant from the Novo Nordisk Foundation, and funding from The Company of Biologists, that will be used to support our forum's first conference, entitled 'Emerging Concepts in Cell and Developmental Biology', which will be held 20-23 September 2022 in Aarhus, Denmark. It will be a hybrid conference to promote more-inclusive conferencing. We have several invited speakers but most will be ECRs.

Aside from the @NewPICellDev account, you're quite active on Twitter. What are your thoughts on using social media professionally?

I joined Twitter in late 2019, and I wish I did it much earlier. It is a great networking platform that has given me visibility and provided me with the opportunity to connect with the scientific community and develop collaborations. I try to be as active as possible on Twitter to promote my lab and trainees, and to 'brag' a bit about our successes. Our New PIs in Cell and Developmental Biology Forum started on Twitter (@NewPICellDev), and this certainly helped us to promote our activities and e-seminars, and thereby attract new members; we were really able to grow and strengthen our community.

I also feel that Twitter is very powerful for sharing new research, for example work posted as pre-prints, so it contributes hugely to open science. It is also a great place to engage with important issues in academia, such as EDI or issues affecting ECRs. However, as with other social media platforms, Twitter is not perfect. For example, it could be more inclusive of under-represented groups in science; there are still many groups that are less visible than others. I also believe that Science Twitter should be wary of the 'influencer' model, because this could lead to a situation where the potential impact of a pre-print is judged by the number of retweets or influenced by who publishes it. Such a model could exacerbate already existing inequalities in publishing. We need to remember that a pre-print is not necessarily promising just because it got 100s of retweets. It is publishers' and our responsibility as scientists to remain vigilant about this issue. But overall, I feel we can use Twitter as an opportunity to fix many issues in academia and build a more inclusive scientific community.

Finally, is there anything Development readers would be surprised to learn about you?

Something that very few people know, because I rarely talk about it, is that when I was a kid, I wanted to drop out of school and start working (at around the age of 11). I wanted to do this to help my family financially. My mother was worried and couldn't convince me that this was the wrong decision, so she went to talk to my French teacher. I remember he came to see me and he said, 'You're very good at school – why would you drop out now?', and he gave me a book to read. It was *Treasure Island*, and it was in French. He said, 'Read this book and let's see what you decide'. So, I read the book and I learned a lot. I learned about persistence and that if you have dreams, you need to work hard for them. And if you work hard, you can achieve them. I cannot imagine what my life would have been like if I had not read that book.