

## INTERVIEW

## Transitions in development – an interview with Noelia Urbán

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Noelia Urbán is a Group Leader at the Institute of Molecular Biotechnology (IMBA) of the Austrian Academy of Sciences in Vienna, Austria. Her research focuses on neural stem cells, aiming to understand how they transition between inactive (quiescent) and active states. We caught up with Noelia over Zoom to find out more about her research and her transition to becoming an independent group leader.

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**Let's start at the beginning, when did you first become interested in science?**

I don't really know when exactly – I think always I've been interested in 'sciencey' things. I felt drawn to them, especially when I was little. As a child, I always liked chemistry, looking at different compounds and how they were transformed into one another – I found it fascinating. When I was in high school, I was very interested in either biology or environmental sciences. I couldn't decide which one to go for, then a teacher suggested that I should choose biology, as I'd see a little bit of everything. Also, at that point, there were no courses on climate science research – they were more focussed on law and regulations. So I went for biology and I think I made the right choice.

**And how did you become interested in neuroscience and neural development in particular?**

I think this just happened naturally. I really enjoyed all the neuroscience-related parts of my undergraduate course and I found it fascinating to learn more about how the brain works. I also liked developmental biology, understanding how you can go from one single cell to a whole organism. So I just sort of put the two together and became interested in developmental neurobiology. And then my future PhD supervisor came to the university to give a talk and he introduced us to neurospheres. At that time, they seemed so cool – you could culture them *in vitro* and do experiments with them. I just was super starstruck!

**You carried out your undergraduate and graduate studies in Spain. What then spurred your decision to move to the UK for your post-doctoral studies?**

I really wanted to move abroad and to see how things were done in a different place. So I contacted the labs that had been 'famous' for me during my PhD, i.e. the labs that were doing things that I really admired, and that I had read lots about. There were lots of different labs – in Sweden, Germany and the UK. But I felt that Francois Guillemot's lab in London was really the right place for me. I got on very well with him during my interview and could see that I could talk science with him. The people in the lab also seemed eager to interact and the atmosphere was extremely international, which I



was drawn to. I had never been to London before going there for the interview, but it seemed amazing and a cool place to live; it all just felt right. So I went for it!

**Did you enjoy your time in the UK/London?**

Yes, I loved it – it really was a blast. The NIMR, where the lab was based, was a bit isolated in the outskirts of London. But it had a great sense of community and sharing. I think everyone who has worked there speaks fondly of it. Scientifically, I had so much fun. I was given a lot of freedom – Francois just provided me with lots of advice and the resources – so I could just go and explore whatever I wanted to. In terms of my personal life, life in London was also super enriching. I made a lot of friends both inside and outside the lab that I still keep in touch with.

But as much as I loved London, I didn't see myself living there forever. I felt a bit tired of having to make new friends constantly as most people were there only temporarily. I had a support network, but suddenly they were all spread all over the world, which is great in some ways but also means you're constantly resetting your life. So eventually, I felt that I needed to move on.

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

I wanted somewhere I could do the science I had in mind. It was also very important for me to find colleagues that were at the same stage as me. I knew that some universities have a very rigid structure, where you might be the only new PI for a few years, and this really didn't appeal to me. I wanted a place where I could discuss things with colleagues who were in the same

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situation as me, even if they were working on a very different topic. I think I just knew how important it was to have this sort of network around me. Of course, I also wanted to be somewhere where I had some flexibility and would be allowed to do what I wanted in terms of facilities, resources and research freedom. So those were the main things that I looked for and, luckily, I found them all at the IMBA.

**How was the transition to becoming a group leader? What has been the best moment, and what has been the most challenging moment?**

I actually found it much harder than I had expected. I guess I had thought that I was fairly well-trained for the position because, when I was a postdoc with Francois, I started supervising students and being a bit more independent. But of course, I realise now that was only the fun part. I hadn't anticipated all the admin, meetings and other things that you have to do as a PI but that no-one trains you for. The level of responsibility you have is also much, much higher. It's been a big learning process. I think I know many more things now than when I started!

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It has definitely been challenging. For example, I barely spend any time at the bench now – I'm mostly sitting at the computer doing lots of writing. And during the pandemic, it was also very difficult to keep everyone afloat; I felt a personal responsibility towards them. But it was a very rewarding experience because I could see that my lab members made very good connections and were supporting each other a lot.

In terms of best moments, I actually feel that now is the best moment. Setting the lab up and getting people trained up was difficult and seemed to go slowly. It was a tough phase. But now the projects are starting to come together and there's more scientific discussion in the group – this is a much better phase to be in.

**What are the main research themes of your group and how did you navigate the field to find this particular theme or niche?**

For me, this was very difficult because I find a lot of different things interesting. In fact, one of the things that I found the hardest when applying for positions was to find this 'niche'. What will define my future research? What will I be known for? These were the typical questions I was asked in interviews and that I found so difficult to answer. I feel that science can lead you anywhere so it's not easy to restrict yourself but, at the same time, I totally see how it's necessary for you to move forward, become independent and find your niche.

I think my niche is definitely neural stem cell quiescence. So what regulates the quiescence of neural stem cells, and what then activates these cells? I really feel like this is an interesting question that very few people are paying attention to. It has important implications in many ways – it can help us understand the amount of neurogenesis that can take place in our brains, but we can also apply the same concepts to any other adult stem cells. It also has implications for ageing and general neural function. In fact, I think it's really funny how focusing so much on this one point – the

quiescence-to-activation transition – actually brings us to some very broad questions. For example, right now we are very interested in understanding signal integration. I mean, we know it is crucial for the quiescence-to-activation transition, but do stem cells do it a little bit differently because they really need to listen to the needs of the tissue that they are in? And, of course, how much of this is context dependent? Actually, our most recent paper, which was published in *Development*, was about exactly that. We found that, when challenged with the same signals, quiescent and active neural stem cells respond in different ways. This suggests that a single cell type, when in different states, can 'listen' to different signals and respond in different ways. But how do they do this? Suddenly, one question led us to a much bigger one.

**In your opinion, what are the most exciting areas in your field?**

I think these sorts of questions relating to signal integration are the most interesting, especially in relation to ageing; this is very much on top of the agenda now for everyone in the field. Understanding the fitness of adult stem cells is a very important topic, as is figuring out the interaction between ageing and systemic signals that affect the function of stem cells. The general topic of adult neurogenesis is also super interesting because we know very little about it. There's a big debate about whether it even happens in humans; I'm almost happy that I don't focus too much on humans! Although there is a part of my lab that is interested in human neural stem cells and understanding whether they are even able to acquire a quiescent state. For instance, it could be that neural stem cells are present in adult humans but become exhausted because they cannot enter a quiescent state, or it might just be that they are there but are just not able to become activated.

**Your lab covers lots of different topics, touching on signalling, stem cells, neuroscience and ageing, so how have you gone about hiring the right people for your team?**

My feeling is that when you start your own lab, the first hires are really important – I feel like they could make or break you. You need to find the right people, not only with the right technical skills but also with the right drive, attitude and personality. Also, because you have so much going on right at the beginning of setting up the lab, it is very important to find someone that you can really trust. I also generally choose people who demonstrate that they are passionate about what we do. I mean, they don't have to be specifically interested in the quiescence-to-activation transition! But it's good if I can see that they are excited by the type of work we're doing, have thought about it and have something to contribute; for me, this is much more important than their previous experience or skills. So I don't mind if someone doesn't have experience with cell culture or using animal models, because these are things we can train them in, but they really need to be interested in what they're doing. It's also important that they are a good fit and are able to work together with the rest of the people in the lab. In fact, I never hire anyone without the approval of my lab members.

I think it's becoming easier with time, as the group becomes more established, and I hope this is also because I'm becoming better at finding the right people. I do also think that, over time, you change the things that you look for. So, the first few people might be quite similar to you and because of this you can really communicate very well with them and you can trust them. But I think at some point it is good to add diversity to the lab so that you bring together different characters.

## You need to find the right people, not only with the right technical skills but also with the right drive, attitude and personality

### How important do you think mentorship is in navigating an academic career?

I think it's really important to have people that guide you through everything. I would say this is especially important if you don't already come from an academic background. Within my family, I was the first one to go to university so they couldn't advise me on what it's like to do a degree or a PhD; they had no clue that I could even get paid for doing a PhD. So you need someone that introduces you to all these opportunities and opens up the possibilities. I think this then has to continue once you are in the system. But I feel that, if it's forced, it can be totally counterproductive. I know in some places they strongly advise you to find a mentor as soon as you arrive and to establish a relationship, but I think this needs to be much more organic. In addition, your mentor doesn't always have to be someone that is much more senior than you or even someone who is in your field – it can just be someone who understands you and who you have a connection with. I also think these mentoring relationships could be initiated by the more senior or established group leaders, because sometimes some people can be a bit shy in approaching someone else. To do this, we really need to change our mentality and give mentoring the importance it deserves, as it is a fantastic opportunity to pass on your experience and change things for the better for the next generation of young scientists. If time spent mentoring was more valued, it would encourage more faculty members, including the more senior researchers, to engage with it.

### I know that you are also very interested in promoting women in science – can you tell us more about this?

Yes, this is something that I'm trying to spend a little bit more time on as, unfortunately, there's so much more to be done. Things are moving forward but we're still quite far from equality. I often bring this issue up in faculty meetings and give my support to the many people interested in tackling this bias. For instance, one of my PhD students has now sparked the creation of an equality and diversity group in the campus. I find it really great that students are now much more aware of the issue and willing to act to change things. I knew of Athena SWAN initiatives but, sadly, they do not exist in non-UK institutions. We are looking into similar initiatives and other ways to analyse and improve our gender balance, for which connecting to other institutes has been very useful.

In our case, if we analyse the whole population of scientists in the institute, then the ratio of male to females is around 50:50. But females are under-represented in the most senior positions, with lots of our senior group leaders and scientists being male.

Of course, this gender bias doesn't apply just to science – it is a problem in society as a whole. In many countries, women are still expected to be home with the kids. In Austria, for example, it's not easy to find a kindergarten that takes your children before they are 1 year old. Then, when they go to school, they often have a break for lunch and it's assumed that mum is at home preparing lunch for the kids and can pick them up, bring them home for lunch, and then take them back to school. Luckily, here on campus we have a very supportive childcare system (it's even included as one of our facilities). But family obligations are only a part of the many

obstacles and challenges working women face. Raising awareness of this is a small but good step forward.

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

I think my advice would be to ask for a lot of advice, because it's always good to hear what other people went through. But then I think the important thing is to know how to then take this advice and figure out what will be useful for you. So, listen to everything that everyone wants to tell you and then try to see what will work best for you. And be patient because it's a slow process.

### Did you ever consider an alternative or non-academic career path?

I would say, seriously, no. But I do keep thinking about what I might do if I get kicked out of the academic career path! So far, things have been going well for me but it is really difficult to know where I will be in a few years and how I'll be doing – there's so much uncertainty. Hopefully everything will work out but my plan B is carpentry. I have no idea about it but it's such a useful thing to do and is something that I'm fascinated by, so I think I will love it!

### I can see that you are active on Twitter – what are your thoughts on using social media professionally?

I have to admit that I'm still not so sure about Twitter. I find it very useful scientifically, for example to find out about new papers or about cool research that's being done. I think it has a lot of potential and can help you to communicate and share ideas. But I'm still a bit afraid of using it because I think it can become a very dangerous place, as things can be taken out of context very easily. I mean, we've all seen cases on Twitter where things suddenly explode and you don't even know why. I also think everyone tries to put on their best face but that's not the reality of what we're all going through. It's been good to see more people being very honest on Twitter, for example to acknowledge that you don't always get all the grants – most of the times you get rejected – and that it's not always easy to publish your work. I actually think this is more useful, as you can share experiences and either give or receive advice. Overall, I can see that it has a lot of potential and is a great tool for reaching out to a lot of people...but I'm still a bit on the fence.

## This gender bias doesn't apply just to science – it is a problem in society as a whole

### You've also been using preprints to share some of your research – how has this experience been for you?

I think it's been very useful but I also think we could be using it in a much better way. We posted our work as preprint because we wanted to share it as soon as we thought it was 'shareable'; it was something we felt proud of. Of course, I think that peer-review is fundamental and we planned to submit to a journal too, but I thought that preprinting would be a good way of getting our science out in the community and starting a discussion about it that could even help us reshape some of our questions or experiments. I was hoping to have more of a community response to it but we actually got very little of that – just some people tweeting and retweeting the preprint, but no real discussion of our results. So I think we have a lot more to do to make this experience better. And I realise that I am part of the

problem too because I very rarely discuss preprints with authors either. I mean, I've occasionally sent an email to someone, but I don't do this very often. It's a very difficult problem to solve but I think we can benefit a lot from making our work more accessible and increasing discussion about it at earlier stages. But I guess our experience with preprinting showed that this sort of discussion and peer-review just doesn't happen by itself.

We also recently tried submitting an article to Review Commons, which I think is a step forward. You feel that you're losing less time with the peer-review process because you get reviews that are journal agnostic and you can use this feedback to make your work better. You can then choose which of the journals you'd like to send your revised article to. We had a good experience with it and

there are some very good journals (including Development!) in the initiative.

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

I think one thing that might be surprising to many people is that I sleep a lot. Like, I love sleeping. Some people might think that being a group leader means that you have so many worries and don't sleep at all at night. But that's not the case for me. I also know some people that sleep for just 5 hours and I wonder, wow, how can they do that? I can't. I really need to sleep...and I'm actually very good at it. I also don't suffer from jetlag, which is very convenient. So I would say that being able to sleep well is my superpower!