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CONVERSATION

Early-career researchers: an interview with Paloma Gonzalez Bellido

Paloma Gonzalez Bellido is a Lecturer in the Department of Physiology, Development and Neuroscience at the University of Cambridge, where she investigates insect vision. She received her Bachelor's degree in Marine Biology from the University of Queensland, Australia, before moving to the University of Sheffield for her PhD with Mikko Juusola, which she completed in 2009. Paloma has been awarded a Cozzarelli Prize and her research has been recognised by the Society for Neuroethology and the Society for Experimental Biology.

Why did you become interested in science?

I grew up in Malaga in Spain. No one in my family is a scientist, but as a kid I used to go to my grandparents' farm with my sister and we were allowed to explore, to be adventurous and to do experiments of our own; I always thought that was fun. I also remember that when I was 5 years old we were watching something on TV and I asked my parents, 'Why are they getting medals?' and my parents explained that it was the Nobel Prize ceremony. I asked my mum, 'How do you get one of those medals?'. She told me that you have to be a really great scientist, and I said, 'I'm going to get one of those'.

Where did you do your undergraduate degree?

I did my undergraduate degree at the University of Queensland in Brisbane, Australia. I wanted to study marine biology and my family believes that if you want to do something, do it well. The University of Queensland had a superb programme in marine biology with many field trips and hands-on practicals and I thought it would give me the best experience and education needed to succeed in what I knew was a very competitive world. I decided that I needed to go somewhere where I could get the skills to succeed later. Also, when I was 16 I went to the USA as an exchange student for a year, so I knew I could live abroad. From a logistical point of view, my parents contacted an advisor who could advise about going overseas as an international student. We narrowed it down to a few choices – Australia, the UK and the USA – and it seemed like Queensland was a great adventure; if you don't do it when you are young, then you are never going to do it.

I also have the most supportive family in the world and they said that they would pay my university expenses – after that, it was up to me. My parents think that an education is the best thing you can have, that it will pay for itself. It also made me realise that I had to work extremely hard because I knew what an extraordinary effort my parents were making.

Originally, when I went to Brisbane for 3 years, I wanted to study and work on coral reef conservation, but then I realised that it was going to be difficult to come up with a theory, or a way to implement a programme, something that would make an impact. It was during my second year, when I was learning about the physiology of all these weird and wonderful organisms, that I became interested in neurobiology. I remember a seminar on the visual system in mantis shrimps that played a huge part in this. That is why I switched to neuroscience.

How did you decide where to do your PhD?

Even though I had a degree from a top university, it wasn't recognised in Spain because only 5 year (not 3 year) degrees were valid at the time. I couldn't work as a biologist in Spain and I couldn't get a PhD studentship in Australia because I wasn't Australian. I felt completely lost. It is one of the situations where you work so hard and everything should have worked out and it didn't. At that point Trevor [Wardill] asked me to marry him; we had met during my undergraduate degree. We tried to work out a way to stay, but it was literally impossible; my career was on the line. Trevor was doing his PhD while we were trying to work it all out; I worked in retail for 1.5 years and also as a zoo keeper until he finished. We decided that we had to get on with our lives and that if we were going to do science, we would do it on our terms. We realised there may come a time when we would hit another wall that was not our fault, that we could not surpass, so one of our terms was that we wanted to stay together; being apart wasn't worth it for us.

Eventually we figured out that if we moved to the UK and I got another degree or a PhD there, then Spain would have to recognise it, because the UK is part of the EU and the UK recognises degrees from Australia. We moved to Plymouth, I got my degree transferred,

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studied an extra year and I then got an Honours degree. After that, I was ready to look for a PhD position.

What did you want to study during your PhD?

I knew I wanted to do neuroscience, to study vision, and I wanted to learn techniques so that later I could answer the questions that interested me. I decided to do a PhD with a model organism; even though I loved ecology, I knew that it was better to learn new science on an animal that was easy to get hold of. I was looking for a PhD working on invertebrate animal models and I saw an ad for the perfect PhD, doing intracellular recordings on the fly eye, from the [Mikko] Juusola lab at Sheffield University, in the UK. I went to look at the university and I was amazed that it was very student centred, which was important for me. I had other interviews lined up and Trevor had a job offer in a different city, but we turned them down, because Trevor was also offered a job in the same lab – we thought it was ideal. I had a fantastic time in the Department of Biomedical Sciences in Sheffield and the people that we met are still good friends.

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How did you find postdoc positions in the same place?

We got jobs at Janelia Farm (HHMI) [VA, USA]. I worked on dragonfly vision, which was a good fit for me. Trevor accepted a job there as part of the GECI project (Genetically Encoded Calcium Indicators), so that we could stay together while continuing our careers. Once again, we had both turned down other offers because we wanted to stay together. After 1.5 years, another opportunity came along for us both at the Marine Biological Laboratory (MBL) in Woods Hole [MA, USA] doing neuroscience with Roger Hanlon on squid. We were really happy there. During our initial interviews, we talked to Roger Hanlon about time allocation and whether we could do our own projects – we were senior postdocs by then and we should be working on things we could take with us; you can't take squid to most places. For example, I really wanted to continue working on the killer flies *(Coneosia attenuata)* that I had worked on during my PhD. Roger said, 'If you are working hard, you can have 50% of your time for whatever you want'; someone had done that for him when he was a postdoc. We spent the 2 years at MBL doing trials, to see how we could rear the flies, and eventually we came up with a protocol that works really well. We didn't use 50% of our time, we worked 10 am to 5 pm on the squid and then we'd do fly stuff in the evening. We always felt that we had complete freedom to advance our careers and that was extremely important.

Can you tell us how you managed the competing priorities of career and family?

While we were at MBL, we decided that it was time to start looking for PI posts and it was also time to think whether we wanted to have a family. One of my mentors said to me, 'There is never an ideal time to have a family. If you wait for the perfect time, you are never going to have kids', so we decided we'd give both of them a try and literally the same month that I found I was pregnant, I was sent an invitation to interview at the University of Cambridge, UK.

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Everything happened at once. I interviewed at the Department of Physiology, Development and Neuroscience when I was 3 months pregnant. I couldn't tell anybody. I was not feeling very well and it was my first PI interview, so I just took it as a great exercise. There was no pressure to get the job, I could just have fun and learn from it. But 2 days later, I got an email from the Head of Department telling me that they were offering me the job. You don't just turn down a PI post at Cambridge, but finding a job there for Trevor was difficult.

What was the best advice that you were given during that time?

Jennifer Morgan (Director of the Eugene Bell Center, USA), a really great friend and PI at MBL, helped us to make the decision. Before I went to the interview, Jen said, 'You need to sit down together and make a list, one column for "wants" and another one for "needs". If they were to offer you the job, this list will help you to decide if you would you take it no matter what or only if certain things happen. It is really important that you do it now. Later, it will be so stressful and there will be so many things tugging your heart strings, but the list will be there to help you make the decision'.

It was fantastic advice, because that list made it clear that we had to give it a go, but we both had to be on board. So Trevor said, 'If I have a 1 year contract, we'll move. I'll support you and we'll figure it out'. Not many people would be able to do that. Our daughter, Abril, was born in December 2013. He applied for fellowships while we were moving. We arrived in Cambridge in April 2014 and I started as PI straight away. A couple of months later, he got offered a Royal Society Fellowship and a BBSRC David Phillips Fellowship. He started his own lab in the department 6 months later. That is how we ended up in Cambridge.

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Setting up a lab with a newborn must be challenging – what hurdles did you have to overcome?

I went back to work when Abril was 4 months old, but Cambridge has a shortage of nurseries. We signed up for the waiting list as soon as we knew we were coming, but even then it was too late. We could only get a part-time place, 2 days a week, at our first-choice nursery, so my parents and sister used their holiday that year, taking it in turns to come and stay with us for 2.5 months until we got a full-time place.

The hardest part was that I was completely sleep deprived and exhausted. I was on my own in my lab, so I was looking after the animals, doing experiments, writing papers, teaching. We were working so many hours it was not funny, but now I have an appreciation that I did not have before. It would have been easy for me to say to my team members, 'I worked incredibly hard when I was a student and postdoc, so why can't you?', but having Abril helped me to understand that they should have hobbies, do something else and enjoy themselves as well as research.

What is your next big career move?

We are moving our labs to the Department of Ecology, Evolution and Behavior at The University of Minnesota, USA, hopefully in April next year, depending on visas. They offered us two tenure-

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track positions in the same department. During this process, we have thought much about the welfare and impact of the move on our team members. For example, the PhD students applied to this programme at the University of Cambridge and my move should not affect them. We have a plan in place so that they can continue their Cambridge studies and also continue their projects with the lab in Minnesota. Making sure the needs of each team member are covered has not been an easy process, taking 5–6 months of negotiation.

Which species are you most excited about working on?

It will always have to be the killer flies, because they were the first species that we found ourselves, that came out of our own thinking and drive. I decided to work on killer flies during my PhD when the *Drosophila* stuff wasn't working and we didn't know what the problem was. I decided to go back to comparative biology. I needed to find a species that is a similar size but sees better than *Drosophila*, so that we could find the important factors that improve visual performance at the same scale. I went online, typed in 'small predatory fly', and they came up. They are found only 2 hours away from my home town in Spain and we were due to fly there because my sister was getting married. Two days before the wedding, Trevor and I went to the field site to collect some killer flies. It was the beginning of my career. Those animals will always have a special place in my heart.

How important are awards for the development of early-career researchers?

I won the 2012 Cozzarelli Prize, the 2011 Capranica Prize from the Society for Neuroethology and the 2009 Society for Experimental Biology Young Scientist award; I think that they were incredibly important at their respective stages for two reasons. One of them is internal: the part of you that always says, 'Maybe I'm not cut out to do this, maybe what I do does not matter, it's not that good', goes away in a flash. It is a confidence boost and solid support that is external to your PI. They also helped in another way. I did not come from a pedigree lab, I didn't have that network; the prizes gave my name recognition. Now I could talk to people and they knew who I was, they knew the type of work that I was doing and that made a huge difference.

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What are the advantages and disadvantages of being a non-native English speaker?

The disadvantages are very clear; reading takes longer, writing takes longer. When you contact people, you might come across with the wrong tone and you don't realise. And there are subtleties that you miss all the time. You may not understand the second meaning behind a conversation. You miss out on opportunities and you have to work harder for longer just to be at the same level. When I was an undergraduate, I would cry my eyes out because I had tried so hard, but I would get work back and it was marked down because the English was not right. Having said that, you come with a different perspective: you had a different upbringing, so you are going to solve things in a different way to other people. It also makes the lab a better place, because science is about looking at things from a different angle.

What is your favourite meeting?

That will always have to be the International Conference of Invertebrate Vision. It is held every 5–6 years and it is organised by the Lund University Vision group in a castle in an isolated location in Sweden, and there is only one session at a time. During meals, everybody sits at long banquet tables; it is a whole week of getting to know people – early-career researchers sit next to the PIs and lots of students get to give talks. All of the senior PIs attend and they come and talk to you afterwards, they give you suggestions, you make friends for life and the food is awesome. It is a great mix of people doing neuroscience and ecology. For me, there is nothing else like it. I have some fantastic mentors in this field and I get to see them at that conference. They tell you what they think without being aggressive and I think that it is important to show the next generation that you need to be determined and keep things moving forward, but that science does not have to be aggressive.

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How do you juggle child-care at conferences?

For the most part, Abril stays with family. We did do a couple of conferences with her when she was very small and there was no childcare, and I found it difficult, because I couldn't concentrate on one thing or the other. That is why I would prefer that she goes to Spain. Having said that, if you don't have a choice then you should be allowed to take your child with you and you should not be looked down upon: attending a conference with a child is not an easy thing to do. There should be something in place that allows people to attend with their children, because if you miss conferences, you are missing the most important networking opportunities.

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One of your postdocs competed in Famelab recently; can you tell us about that experience?

Kate Feller came to my lab with a Marie Curie Fellowship and part of the fellowship was to think about professional development and activities that will help the postdoc become independent and build skills. We looked at a few things and we found Famelab, which is run by the British Council. You have to stand up for 3 minutes and give a scientific talk of your choice where you explain a scientific concept. Kate has great people skills and it was a natural fit for her. The judges judge originality and clarity, etc. Kate chose all of her topics, put together her talks completely on her own and rehearsed them with us once; she put in so much hard work. She competed in the regional final, which she won, and then she went to the national final in the Science Museum, London, where she gave a very passionate and inspiring talk about climate change.

Paloma Gonzalez Bellido was interviewed by Kathryn Knight. The interview has been edited and condensed with the interviewee's approval.