

## CONVERSATION

## Early-career researchers: an interview with Marianne Porter

Marianne Porter is an Assistant Professor at Florida Atlantic University, USA, where she studies biomechanics, functional morphology, and bioinspired robotics. She received her Bachelor's degrees in Zoology from Northern Arizona University, USA, in 2000 before completing her PhD with Adam Summers at the University of California, Irvine, USA in 2007. She then completed a postdoctoral fellowship with John Long at Vassar College, USA, before rejoining Summers at Friday Harbor Laboratories, University of Washington, USA.

### Where did you grow up and how did you become interested in science?

I grew up in Arizona and I became interested in science because we lived out in the country. We had a big yard, and my siblings and I soon discovered that if we asked our parents for a pet, the answer was no, but if we brought a pet home, it could stay. We grew up being adventurous outside, and science just came naturally because we were able to go camping and explore, to ask questions and notice things. My parents encouraged the interest, and my grandparents were also hugely influential. They always told me that I could do whatever I wanted to and they'd support me. Unfortunately, in my formative years, my high school biology teacher told me that women couldn't be scientists because you can't also get married and have kids. I grew up in a really small rural town and that was some of the careers advice that I got. Luckily, my parents and grandparents told me not to listen to that!

### We grew up being adventurous outside, and science just came naturally

### How did you go about finding a university and a degree course that fitted your interests?

My dad is very practical and business-oriented. I was the oldest of four kids and he was thinking how he could help all of us go to college, so he told me that there are scholarships to in-state schools. That automatically narrowed my search to the three state universities in Arizona. I grew up in the Phoenix area and I'd always been to a lot of swimming and high school events at the nearby Arizona State University in Tempe, so he steered me away from there, because I already knew the campus. He loved where he went to school in a college town, Ohio University in Athens, OH, USA, so he was a big advocate of me going to Northern Arizona University in Flagstaff, AZ, USA, because it had a great biology major, it is up in the mountains and it snows. At that point I thought I should get a business degree, because that's what I had seen modelled by my dad. But I also remember him very clearly telling me that your career lasts a really long time, so you better pick something that you love, because whatever job you're doing, it is going to take up a lot of your life. So, I thought, 'Okay, I'm going to be a zoology major', and he said, 'Great, do that.'

### What classes stood out for you at Northern Arizona?

I really enjoyed my animal biology, invertebrate biology and vertebrate zoology classes. But the turning point of my academic



career was when I took ecology because it was about being able to synthesize something more from the animals that you were studying and learn how they interact with their environment. I was starting to see how majoring in science could become a research career. I loved the class so much that I finally went and talked to my professor, Tom Whitham, in his office hours. He mentioned that one of his graduate students, Jon Ruel, was looking for an undergraduate researcher to help during his field season. I had no idea what that meant, but from the description I thought, 'I can do that'! That was my first research and field experience and it was fantastic. I was able to learn how to ask questions and design experiments and, eventually, I was able to start designing my own experiments. It was a transitional moment; I saw what a scientist's job actually looked like and I knew that it was the career that I wanted. This is why it's so important to have diversity in jobs and in science. It's easier to see yourself in a job if you can see people who look like you – for example, women and other minorities with whom you identify – in faculty or research scientist positions.

### I saw what a scientist's job actually looked like and I knew that it was the career that I wanted

### When you decided you were looking for graduate programs, what did you look for?

By then I had a strong background in plant ecology. I had stayed at Northern Arizona doing plant ecology for my Master's and during that time this super-charismatic guy called Adam

Marianne Porter works in the Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL 33434, USA.  
E-mail: me.porter@fau.edu

Summers came to give a seminar. He had just gotten a faculty job at University of California, Irvine, CA, USA, and was beginning to recruit graduate students. He gave an extremely compelling talk on biomechanics and cartilage from stingrays. At that point, I had taken comparative anatomy with Kiisa Nishikawa, and I had been talking to Alice Gibb, who was just starting her research lab at Northern Arizona, so I had a good biomechanics background from classes, but I still didn't know much about that research area. When I saw Adam's talk I knew I wanted to study biomechanics, and even though I had been studying plants, Adam welcomed me with open arms, because he had also had a pretty non-linear academic path. In my applications, I had written about an interesting project on plant biomechanics, and I basically told him that I had beginner scientist skills; I knew how to do statistics, design experiments and how to be out in the field. I had a decent ecology background, but I knew nothing about biomechanics. In my first quarter of grad school I learned more about biomechanics and physiology, and one day I found a vertebral column on my desk with a note that said 'Dissect me'. Dissecting this vertebral column from a shark got me thinking that it kind of looked like a plant stem. After that, I decided to look at the material properties and biochemical components of shark cartilage – basically, what it is made of and how it works – for my PhD.

#### **What factors guided your choice of postdoc?**

I wanted something that was going to move my career forward; I knew I definitely wanted to be a faculty member. But location was also a consideration, because my husband, Stephen Kajiura, and I were dating long-distance at that point, which was not ideal. I was in California and he had a faculty position at Florida Atlantic University (FAU). I wanted to make a career move that would keep me competitive on the job market, because the goal was to end up with a two-career solution. John Long at Vassar College, USA, had been hiring a postdoc a few years earlier and he was one of my academic heroes, so I reached out to him and asked if he still had funding. He did and I talked to my dissertation committee about my options. They said the same as my dad, which was, 'Do what you're really going to love and are most excited about'. So, after years of reading John's work and seeing him at conferences, I decided to go and work with him. I had an amazingly productive postdoc and John and I were able to write successful grants that continued my postdoc funding.

#### **How did you go about applying for faculty positions?**

The global economy fell apart just when I started my postdoc in 2008, so I was applying for jobs at a time where universities were cancelling their job searches and had stopped hiring. It was horrible, but I just kept applying. After a couple of years, the economy started to pick up and jobs were being advertised again, but there were a lot of people looking at that time and I had the location constraint. By then, Steve and I were married and he was also looking for jobs. During those 5 years, I applied for 119 jobs and had 11 on-campus interviews. Eventually, my funding with John ran out, and I went back to teach and do research at Friday Harbor Laboratories, University of Washington, USA, with Adam.

### **During those 5 years, I applied for 119 jobs and had 11 on-campus interviews**

Searching for faculty jobs was a very difficult time for me and I was having a real crisis of confidence. I was literally a few weeks

away from giving up, moving to Florida, and finding a different, non-academic, career path. Because I did not have many work obligations at that point, Steve and I decided it would be a good time to think about starting a family. As life tends to happen, we were finally able to secure several individual job offers, competing offers and then two positions at FAU after 6 years of job searching. I had morning sickness when I interviewed and when I was negotiating with the Chair of the Department. I negotiated my whole job knowing that I was going to have to re-negotiate in 3 months when we announced my pregnancy. These were all major life changes in the span of just 2 months.

#### **How did you arrange your maternity leave?**

I was supposed to be teaching in the spring semester (my first semester on tenure track), but that was also when I was going to be having my baby. I decided that I wanted to have some solutions when I had the chat about parental leave with my department. I arranged to team-teach the class with one of my colleagues, Tricia Meredith; she had a class running at the same time and is also one of my best friends. I proposed that I could teach the first half of the semester for both of the classes and she would do the second half of the semester. It was great to be working with such supportive colleagues already, and I think the Chair was pretty happy that I had a solution for the second half of my teaching that semester.

In addition, I decided that I wasn't going to take any salary in the summer months after the baby was born, and my university has an amazing semester of paid parental leave, which is not common in the US. This meant that I was able to take approximately 8 months off to spend time with my baby. I knew that I only wanted to have one child and I wanted to enjoy this time. During my maternity leave, I set clear boundaries for myself and did very little work, but my two graduate students started their programs while I was on leave. We had communicated before they started the program, and they were able to use the semester that I was gone as time to learn how to be teaching assistants, take classes and think about their projects.

#### **What impact do you think this period of leave might have had, or may have, on your career?**

My parental leave is completely obvious on my CV. My son was born in 2014 and I have two papers from that year – which were accepted before I went on leave – and zero papers in 2015. You hear people talking about the cost of motherhood for academics; whether women should stop their tenure track clocks to have a baby; what that looks like when you go up for tenure; do you get 'punished' for doing it? I don't know if I will. My attitude was that I wanted to take leave seriously and not work during that time; I wanted it to be obvious to the administration that families need this leave. I list it on my CV as 'parental leave'. Recently, I applied for an Early Career award within the university, and the evaluators emailed back because they had some questions about whether I was still classified as Early Career. I explained that I stopped my clock in that year and they said that was fine. I don't know if it is going to be detrimental moving forward, but it shouldn't be.

### **I wanted it to be obvious to the administration that families need this leave**

#### **What were the highs and lows of setting up your first lab?**

Even though I had a pretty detailed budget and list of supplies worked out over several years of job searching, you always learn

from your mistakes. I wanted to buy equipment that was going to be central to the work that I wanted to do, so I bought an Instron for mechanical testing and a few key pieces of video equipment. I also invested heavily in my graduate students' research projects, because having successful graduate students and getting them doing projects, presenting at conferences and producing papers all adds to my tenure 'package', showing that I have a working, functional lab that does its own thing. The thing that was really hard for me was the extensive amount of paperwork. I don't love it, so it seems onerous and annoying.

#### **What's the most important skill a new PI must have, and how would you advise your students to develop it?**

Creative time management and general management are basic skills that require practice. It is important to be able to manage undergraduates and grad students when you're a PI; to make sure that people are on track and meeting their goals, so that everybody is moving forward. I encourage my grad students to develop their management skills by training undergraduate and high-school students working in the lab. So, we have a near-peer peer-mentoring structure set up. I spend a lot of time mentoring the graduate students, who spend time mentoring the undergrads and the high-school students.

### **I encourage my grad students to develop their management skills by training undergraduate and high-school students working in the lab**

#### **How do you mentor your students?**

Every semester I ask my students about their research and career goals and then we re-visit them every couple of weeks to assess progress and problems. This semester I asked the graduate students to add health and wellness goals to their lists. They don't have to tell me, or anyone, about these personal goals. I ask simply whether they are meeting their health and wellness goals and, if they aren't, then I encourage them to go do what they need to in order to meet those goals. Health and wellness goals will be different for everybody. When I was in grad school, I always had swimming and my swimming friends; they were my mental break from the world and my emotional anchor. I also tell my students that they have access to free counselling services, so if they need to go talk to someone they can. Personal goals like health and wellness are an important part of life and everybody should have them.

### **Personal goals like health and wellness are an important part of life and everybody should have them**

#### **How do you prepare your students for life after grad school?**

I think that we need to prepare graduate students to know that there are many career options beyond academia and they can have their dream job. I run a graduate seminar and one of the goals is to bring in local speakers from around South Florida who have advanced

degrees – including PhDs – but don't have traditional academic jobs. We've had environmental consultants, people who run research programs at high schools, and scientists from various not-for-profit foundations, who give students examples of various career options.

#### **Can you integrate outreach into teaching?**

I've been teaching Animal Locomotion to graduate and undergraduate students. When I was in grad school, I loved being able to add the outcome of a class to my CV, so I have my students develop a lesson related to animal locomotion. Then, we go to the local high school and give the lectures to the science class. My students get to add a guest lecture to their CV, and it's a way to get researchers out in the community.

#### **There is a link on your website that says 'Drone SOP'. What is that for?**

We're using drones to look at volitional swimming kinematics; we recently presented these data at the Society of Integrative and Comparative Biology annual meeting in Florida. Every winter, we have an amazing opportunity when the black tip sharks migrate down and hang out off the coast of our South Florida beaches for 4 months. There are thousands of sharks. My student, Braden Ruddy, goes to the beach with the drone in the morning. We have a standard operating procedure (SOP) for hovering the drone over the water and collecting video data of the sharks swimming. Because they're in very shallow water and the water is clear, we're able to do really great point-tracking and get kinematic data similar to what we've been able to get in the lab for other species. The protocol is also on my lab's website and we're trying to promote it to other drone users, because drones are becoming more of a household item and many people at the beach have them. If we can share our methods with people, we hope that they can get a cool clip of video data and send it to us. It's a great opportunity for citizen scientists to contribute and it's another opportunity for outreach with local high schools, as many high schools have drone clubs now.

### **It's a great opportunity for citizen scientists to contribute**

#### **How important is SCUBA diving for your research?**

It's becoming more important. Some of my projects are field-based so I SCUBA dive to collect data. Swimming with sharks is awesome, but how dangerous it is depends on the situation. You need to make smart decisions, such as when you go and who else is nearby, and you also need to think about how the animals are behaving. For example, I don't like diving with sharks when someone is spearfishing nearby. When a group of us gets into the water with sharks, every diver gets in one at a time, so you don't have 10 people jumping in at the same time creating chaos. I always joke that if you see a shark, you're *super* lucky, because most of the time when I'm in the water, they're swimming away from us.

Marianne Porter was interviewed by Kathryn Knight. The interview has been edited and condensed with the interviewee's approval.