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CELL SCIENTISTS TO WATCH

Cell scientist to watch – Sabine Petry

Originally from Germany, Sabine Petry received her Diploma (MSc) from Goethe University in Frankfurt and undertook her Master's thesis at the Max Planck Institute of Biophysics. She then moved to the UK to pursue a PhD under the supervision of Venki Ramakrishnan at the MRC Laboratory of Molecular Biology in Cambridge. In 2008, Sabine started her postdoctoral work in the laboratory of Ron Vale at the University of California, San Francisco as an EMBO fellow and then an HHMI postdoctoral fellow of the Life Science Research Foundation. She started her own lab at Princeton University in 2013, and her work has already been recognised with an NIH Pathway to Independence K99/R00 Award and the Kimmel Scholar Award for Cancer Research; she was also named a Pew Scholar and Packard Fellow in 2014. Sabine's research combines structural, biophysical, biochemical and cell biology methods to study the mechanism by which microtubules build cellular structures, allowing cells to attain a particular shape and function.

What inspired you to become a scientist?

I was simply in awe when I first heard about DNA and the central dogma in high school. The more I learned about biology and chemistry, the more I wanted to understand how life works on a molecular level, and I knew that I needed to be a biochemist in order to pursue this interest. So that's what I ended up studying during my undergraduate degree, and once I did my first basic research internship at the Max Planck Institute for Biophysics, I knew that was going to be my career.

What motivates you now?

The short answer is curiosity. I want to understand the rules that govern how macromolecules interact and how they make life possible. Since I started my lab, another motivation is that, as a scientist, I have the chance to contribute to education and outreach efforts. I also really enjoy running a lab and training the next generation of scientists to the best of my capabilities.

What is your research focused on?

The mission of my lab is to understand how cells acquire their shape, position organelles, move materials and segregate chromosomes during cell division. These features are organised by the microtubule cytoskeleton, which resembles the skeletal system that supports the human body. Its functional importance relies on the precise arrangement of microtubules in the cell and, to achieve this organisation, microtubules are generated at different locations and then organised by proteins that sever, polymerise, shrink, bundle or anchor them. Basically, we want to understand how these functionalities work mechanistically and we study them by combining methods of cell biology with biochemistry, structural biology and engineering. Our hope is to ultimately reveal how the microtubule cytoskeleton builds structures and supports the central functions of the cell.

You use a wide variety of methods. Is this something you specifically had in mind during your training?

I was initially intrigued by understanding the structure of macromolecules, and so I became a structural biologist and pursued that during my PhD. But, at the end of the PhD, I was at a decision point: I didn't want to be limited by a technique so I chose to enter a different field, become a cell biologist and learn light microscopy to ask functional questions. Ultimately, the training that I received during my PhD and postdoc now makes it possible for me and my lab to address the problems that we're interested in with any method that is necessary.

Did you feel there was a risk to changing fields?

I think it's risky, but life is short, and you have to take risks and learn what you need to address the questions you're interested in. I heard a lot of people say that the postdoc is most useful for learning the

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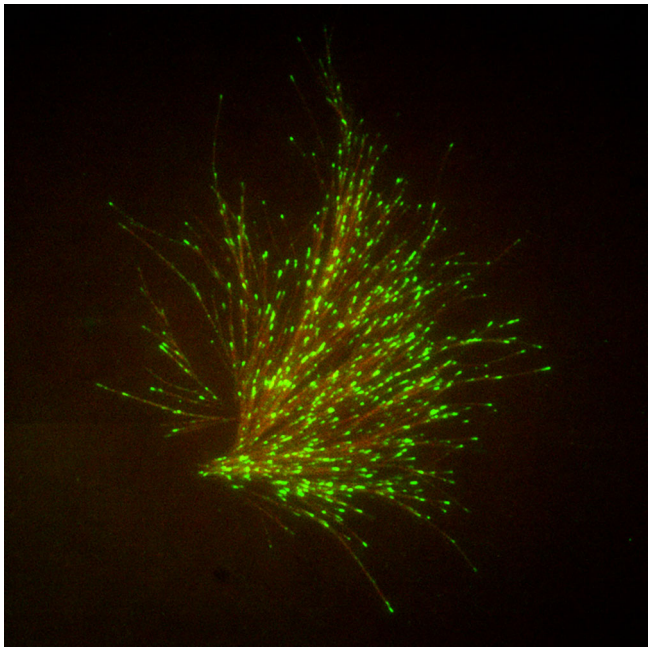

Microtubules (red with growing tips in green) grow off the wall of existing microtubules, which is visualised by total internal reflection (TIRF) microscopy. This recently uncovered mechanism is termed branching microtubule nucleation.

techniques that you want to apply later on, and it never made sense to me until now. So, yes, I think it was risky, but for the transition between PhD and postdoc my advice would be to change fields, do something different, broaden your knowledge and broaden your skill set so that you're not limited in what you're going to address later on.

What is the most important advice you would give to someone about to start their own lab?

Talk to as many young PIs as possible who are few years ahead of you. They just had to master what you're about to go through and you can learn from their mistakes and from their successes. But remember that every path is individual. So what worked for somebody else won't necessarily work for you and you need to make your own choices. One thing that worked well for me is to treat starting the lab like a project with experiments. Some of them will work out and some won't. The important thing is to recognise this and to make it better next time.

> **" (…) treat starting the lab like a project with experiments. Some of them will work out and some won't."**

What challenges did you face when you started you lab that you didn't expect?

I knew that there was a lot to do and that it involved a lot of multitasking, but you really don't know what it is like until you're in it. Also, things that simply worked in the old lab had to be set up again and it certainly takes time and troubleshooting skills, and you really have to start from scratch. But the biggest challenge is to recruit the right lab members and to assemble an excellent team. Nobody teaches you how to judge who will be the right fit for your lab. I feel very lucky with the lab members who joined my lab, but I also had help from colleagues during that process who simply have more experience in interviewing and assessing candidates.

What is the best science-related advice that you have received?

I think it's to follow your curiosity and passion. It's the key to everything, also outside science. Choose the right role models and mentors and actively seek out their support. Be fearless and address the biggest questions you can think of. Finally, and I don't know if somebody actually told me this, but I try to tell it to my mentees: believe in yourself and trust that you can do anything that you set your mind to.

> **" (…) believe in yourself and trust that you can do anything that you set your mind to."**

How do you get the most out of scientific meetings?

I make a list of the people I want to talk to during the meeting and directly contact them to make this possible. This way the important interactions take place before the meeting passes by. In addition, I learned to not attend every session. I used to go to every single session that I was being offered and I think it's just too much to take in. I realised that if I skip a few sessions but then attend the ones that are valuable to me or that I'm really interested in, with more energy and alertness, then I actually get a lot more out of it.

How do you achieve work/life balance when you start as an independent investigator?

I actually started a family right before I started my lab. I just had to say that family comes first. You have to make compromises but, again, you have to do what is right for you and what makes you happy. It's also important that you take care of yourself so you can be the best parent and lab head that you can be. Work is important but it cannot take over your life.

Do you enjoy participating in outreach activities?

Yes, it's something that I enjoy, although I also think it's a duty. I'm involved in the American Society of Cell Biology Women in Cell Biology (WiCB) committee, and we do a lot of outreach to help foster careers of female scientists. It's important to be a role model and encourage others, particularly if you can see that they may be struggling with something that you have struggled with. I feel like I had lots of mentors and people who supported me, and I want to give that back.

I understand that you played professional basketball when you were younger. How did you get into it?

I started as a teenager doing track and field and my biggest success was being the German Youth Champion in pentathlon. I switched to basketball and played in the youth national team and then ended up playing professional basketball during the last two years of high school. I would go to school during the day and then in the evening drive for an hour to the basketball team practice, shower, drive back, do homework, and on the weekends travel around Germany and Europe. Of course, I did it for fun, but I think what it taught me was how to manage time, how to set goals and work with the team towards them, motivate each other, how to cope with loss, how to do it better next time and how to win. I feel like everything I learned from doing professional sports as a teenager is the secret to success

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for anything you want to do, and it also helps me now in my scientific career.

And what is an interesting fact that didn't make it to you CV?

I feel like one of the craziest things I did was the third highest bungee jump in the world, at Victoria Falls between Tanzania and Zimbabwe. It was definitely one of the biggest immediate risks that I took but, sometimes, when I feel like I can't do anything I remember how I convinced myself that I could do that bungee jump, and I now use it as a motivational tool for myself.

Sabine Petry was interviewed by Anna Bobrowska, Editorial Intern at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.