

CELL SCIENTISTS TO WATCH

Cell scientist to watch – Jacky Goetz

Jacky Goetz graduated in pharmacology and cell biology from the University of Strasbourg in France and moved to Canada to the laboratory of Ivan Robert Nabi at the University of Montreal and later the University of British Columbia, to work on the interaction between the endoplasmic reticulum and mitochondria, as well as the glycosylation of membrane proteins. In 2007, he received his PhD from both the University of Montreal and the University of Strasbourg. For his postdoc, Jacky moved to the Spanish national centre for cardiovascular research (CNIC) in Madrid and the laboratory of Miguel Angel del Pozo to study the tumour microenvironment. Subsequently, Jacky joined the laboratory of Julien Vermot at the Institute of Genetics and Molecular and Cellular Biology (IGBMC) in Strasbourg to pursue his interests in mechanotransduction. In 2012, he won the French Society for Cell Biology (SBCF) Young Scientist Award and, in 2013, he started his own research group – ‘Tumour Biomechanics’ – in Strasbourg to work on intravital imaging methods and biomechanical forces during tumour progression.

What inspired you to become a scientist?

I don’t think I was ‘meant’ to become a scientist, unlike others. My two siblings and I grew up in the countryside in very modest surroundings – my dad was a car mechanic and my mum raised the three of us. Science was never a topic, I only cared about football. But things changed when my biology teacher showed us the 3D structure of proteins. I was 16 years old, absolutely fascinated and this was the beginning of my interest in science and, particularly, imaging approaches.

“...I [...] love to communicate science – to give seminars, and to talk about our discoveries in the lab.”

What motivates you now?

My scientific interest lies in observing and unravelling unexpected features of biology and, in particular, of metastasis formation. For quite some time I have been fascinated by the mechanism of metastasis and I like to study it *in vivo* at a high spatiotemporal resolution. But I also love to communicate science – to give seminars, and to talk about our discoveries in the lab. Another aspect that motivates me is that I see science as an art. We all have our own way to think about and design our experiments, to analyse the results and to assemble figures, which is actually one of the things I enjoy the most.

What questions are your lab trying to answer just now?

Our research approaches are divided into three main axes. First, we develop pioneering imaging approaches, such as intravital correlative light and electron microscopy (CLEM). We work on this in the zebrafish and mouse in collaboration with Yannick Schwab (EMBL, Heidelberg); the idea is to visualise and record the



Fig. 1. Jacky Goetz

dynamics of an event within living tissue, and then go back to this tissue once it is embedded in resin to perform electron microscopy, which allows for a really high resolution. The second approach is to apply our interest in mechanobiology to tumour progression. We want to know to what extent biomechanical forces actually do contribute to the mechanism of tumour metastasis formation. Together with Sébastien Harlepp (IPCMS, Strasbourg) – who does optical tweezer experiments – we are able to measure forces in living zebrafish embryos. Our third approach is to understand how tumour cells secrete exosomes and prime metastatic niches. We apply CLEM, but also next-generation sequencing to these extracellular vesicles, to work out how exosomes are capable of priming these niches at a distance from the primary tumour.

What has been the most influential publication or work in your field recently?

I am more influenced by scientists and the ways they do science. For example, I am in love with the science performed by Jennifer Lippincott-Schwartz (NICHD, NIH, Bethesda, MD). We’ve met many times and each time I feel the same admiration for her; she is truly an inspiration to me. When it comes to my research interests, the works by Erik Sahai (The Francis Crick Institute, London) on tumour invasion or by David Lyden (Weill Cornell Medical College, New York, NY) on the pre-metastatic niche are really influential.

What challenges did you face when starting your own lab that you didn’t expect?

The management part of running a lab is something that you’re not prepared for when you are a postdoc or PhD student. Nobody tells you

Jacky Goetz’ contact details: Tumour Biomechanics, MN3T team, INSERM U1109, 3 Avenue Molière, Strasbourg 67200, France.

E-mail: jacky.goetz@inserm.fr; Twitter: @GoetzJacky



Fig. 2. Jacky with his wife Audrey, and daughters Lili and Juliette before the football Euro final 2016.

how it is to build and organise a team – I had not anticipated it to be so difficult and demanding. I feel lucky now to have great team members who are on the same wavelength about research and who embrace the way I see science – this makes life in the lab very enjoyable.

How are the challenges that you're facing now different?

I wish I could spend more time focusing on reading good papers and sketching ideas, but there are several responsibilities and things to deal with on a daily basis. For example, I have been nominated as one of the cell biology experts in the evaluation committee at the National Centre for Scientific Research (CNRS). Our job is to evaluate all cell biologists and to participate in their recruitment; this is time-consuming because we are, of course, reviewing a lot of applications, are recruiting new scientists and so on..., but it gives a new, interesting dimension to the job.

Are you still doing experiments yourself?

Unfortunately not! I like to go to the microscope every now and then but, to be honest, it is not my turn anymore and people in the lab expect and need me somewhere else. However, I have some ideas and I am planning to go back to the bench sometime soon, probably through a sabbatical – if anybody is interested in welcoming me in their lab, please contact me! *laughs*

How do you achieve a work/life balance when you're trying to establish yourself as an independent investigator?

Although I love science and live for it – as any proper scientist does – I think that your private life is essential and should not be put on the side. I have a wife and two young daughters and they are my priority. Since they were born, I try not to work too late in the evening so I can enjoy time with them and we're also putting a lot of emphasis on travelling together. Also, I'm addicted to sports like tennis and cross-country exercises. I recently crossed our small Alsatian mountains with a friend on a four-day mountain bike trip of about 400 km – it was very intense but it felt fantastic, and you really disconnect from the work in the lab.

What is the best science-related advice you ever received?

During my thesis, I had lots of doubts about my work and career. My PhD supervisor Ivan Robert Nabi invited me to his house and we had a long discussion about everything. I was impressed that he

really listened to my thoughts and he convinced me to pursue a career in research. He explained that science is made of many obstacles and his advice was not to give up and to show perseverance. By this I mean to fight for what you want to do and follow your intuition because, in terms of projects, it's also wise to acknowledge if things don't work and to move on to another project. I base my decisions a lot on my gut feeling and intuition; I don't follow a strategy or long-term plan.

What is your advice on establishing good collaborations?

Again, I follow my intuitions. You want to work with people you can get along with and whose science fascinates you, and ideally people who have an expertise in something that you don't have at all. I put priority on this and I have been very lucky with my collaborations; one example is Yannick Schwab, with whom I developed intravital CLEM – and a lasting friendship.

How do you get the most out of the meetings you attend, particularly in the early stages of your career?

During meetings, I like to go to sessions that are not necessarily essential to my current research at first glance. Some talks just go past you without any impact but then you might get inspired and be amazed by listening to one specific talk. I think this is how I established collaborations in the past – you love the presentation, you make the connection with your own projects and you go and talk to this person, without having planned it beforehand. It's very similar to how I travel with my wife and kids: when we visit big cities, we don't follow a guide book; we usually just pick some place and start walking – we like to be surprised by discovering things randomly.

What elements, inside or outside the lab, have been key to your success so far?

I don't feel that I am more successful than others; I have a passion for discovering new things, for developing new ways to display biological features. And it helps to have a tiny bit of perseverance – but when you enjoy what you do, this comes easy.

“...I like to do manual labour. I enjoy being in the forest and chopping wood for the winter.”

Could you tell us an interesting fact about yourself that people wouldn't know by looking at your CV?

One thing is that I'm very interested in scientific journalism. I used to be a monthly columnist for a French newspaper when I was in Vancouver. I would pick a subject freely and write about it, and this was something that I really enjoyed doing. The other is that I like to do manual labour. I enjoy being in the forest and chopping wood for the winter. Actually, I quite often think that I might end up not doing science all my life – I'm fascinated by the work carpenters do and it's a connection to my upbringing in the countryside. Together with my stepfather, I renovated an old house here in the Alsace region. To put a timber frame on top of a house is a combination of different things: you need to prepare the wood, design and build the frame, and you need some knowledge of physics to put the frame up and – of course – physical strength. It was one of the most emotional things that I have done in my life.

Jacky Goetz was interviewed by Manuel Breuer, Features & Reviews Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.