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CELL SCIENTISTS TO WATCH

Cell scientist to watch – Sascha Martens

Sascha Martens obtained both his Diploma and PhD at the University of Cologne in Germany in the laboratory of Jonathan Howard. He pursued his postdoctoral training as an EMBO Long-Term Fellow in the group of Harvey McMahon at the Laboratory of Molecular Biology in Cambridge, UK, during which time he also received the AAAS/Science Program for Excellence in Science Award. In 2009 Sascha became a group leader at the University of Vienna Max F. Perutz Laboratories. Sascha holds an ERC Starting Grant and is an EMBO Young Investigator, and he was recently awarded an ERC Consolidator Grant. His research focuses on understanding the mechanisms that orchestrate autophagy.

What inspired you to become a scientist?

I was dragged into science by my family, my father in particular. He is a physicist and, therefore, he always had science books lying around and I could ask him questions about the universe. I wasn't really interested in biology until I was a teenager. There was a book at home about modern molecular biology, and I found out that there are actual mechanisms behind the biology we learnt. From then on I was drawn to molecular biology.

What motivates you now?

I'm curious, and that's the main driving force. I particularly like to unravel real mechanisms. What's also motivating is that, if you understand how the body works, maybe one day you could interfere and find treatments for some terrible diseases; and now, when the older generation is more prone to many of these diseases, you figure out how relevant this actually is to your own life as well.

What is the research focus of your group?

We work on autophagy, a mechanism by which cells can eat parts of themselves, for example during starvation. When I came to the field, starvation-induced autophagy was still the main type of autophagy but, over the years, it became clear that most autophagic processes going on in our body are probably of the selective type, where the cell identifies cargo material that needs to be degraded and grows a membrane specifically around this material. I think it's fascinating that cells make a new complex structure from scratch, and they do it exactly when and where it is needed. We focus on selective autophagy because it's also easier to access experimentally. We use two main model organisms, yeast and mammalian and, in particular, human cell lines. However, a lot of our work is actually biochemical reconstitutions that enable us to formulate hypotheses about the mechanism by which these factors act that we can then test in yeast or human cell lines. My dream would be to, one day, reconstitute the process of selective-autophagosome-formation with purified components. When I started my lab I changed my field of research from synaptic vesicle fusion to autophagy, and my main goal was to try to reconstitute autophagy *in vitro*. And now, after 6 years, I think one day we will be able to do that.

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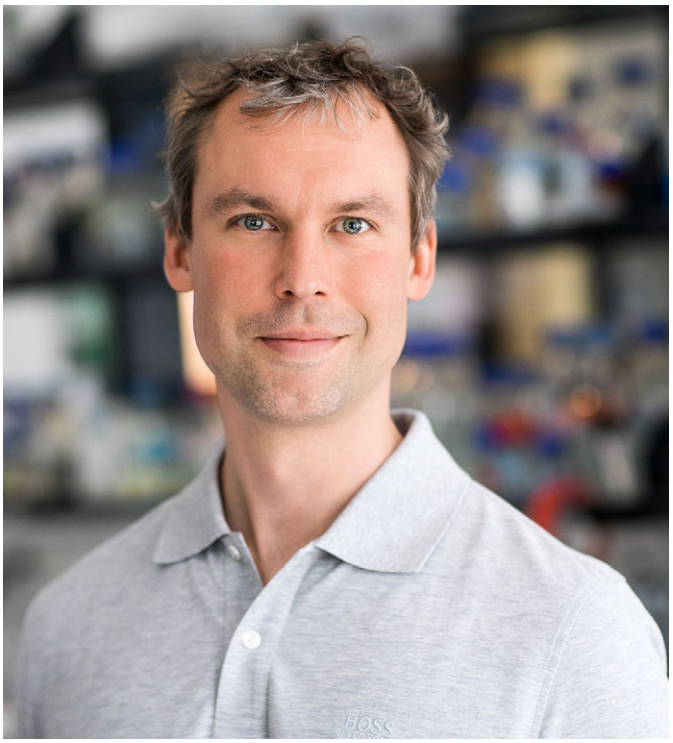

Fig. 1. Portrait of Sascha Martens (©Daniel Hinterramskogler).

Why did you change fields when starting your own group?

During my postdoc in Harvey McMahon's lab I worked on synaptic vesicle fusion. I used biochemical reconstitutions and had a very biochemically driven approach, and there were very few people doing this kind of research in the autophagy field at that time. Many autophagy genes and proteins have been identified but, in order to really understand how they act mechanically, you need to do biochemistry. So I thought I could have much more impact in the autophagy field than in my previous field and work on something where so many new mechanisms are waiting to be discovered.

Was changing fields helpful for your transition to independence?

Yes, it helped a lot. I had no problem showing that this is really my work, rather than the work of my former postdoc supervisor. In that sense, if a change of field works out, it's very positive. It's not just continuing the line of research that was invented by someone else. I think, if it works out, it can be very positive but it's a bit tough in the beginning. I initially thought there would be more of an overlap between the membrane trafficking and the autophagy fields. You also have no preliminary data from your postdoc time, so it's really crucial that the first lines of research work out.

"It's difficult to really know what your lab is like when you're mostly in your office."

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Fig. 2. Autophagy: How cells eat themselves. An illustration by Oliver Hoeller (http://oliverhoeller.com).

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

As a PI, you have to lead a team and the team is a crew of human beings. It's not only about how the experiments work but also about leading people. Unexpected things happen, for example a PhD student may get pregnant or become ill. I initially didn't expect these things and I wasn't trained for how to deal with them. Being a student or postdoc is different than being the PI and having to deal with these kinds of issues.

And how have the challenges changed now that you are more established?

I think the challenge now is to not become too detached from the lab, to still know what's going on. At the moment, I feel my people like to do science, and they discuss it a lot, they're very enthusiastic and help each other out and I would very much like to keep this atmosphere in the lab. It's difficult to really know what your lab is like when you're mostly in your office or going to conferences.

"In the beginning, stay small and focused."

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

I got this advice from a number of people, including from our director, Graham Warren, who said "in the beginning, stay small and focused". It may work differently for different personalities, characters and backgrounds but, for me, that was the key. I personally enjoyed it much more because I could devote a lot of my brainpower to every individual project, and I didn't have to dilute my time over many projects. It makes a big difference whether you spend time really thinking about something or whether you simply look at it for a few minutes, and for me that was only possible because I had a small lab and I did a lot of work myself. The other thing is that, when you start, people will come and, for example, ask you to be on a seminar or PhD committee, and though it's important to contribute to these organisational duties, in the very beginning what's most key is to get your research going. When you don't have the capacity to do proper work you simply have to say 'no'.

Could you share with us an interesting fact about yourself that you wouldn't put on your CV?

When I turned 40 I bought myself an electric guitar. I always wanted to but I never had the time, and then my wife convinced me to just do it. It's a new experience because it's very tough, and I'm sure I would never be able to earn money with those skills. But I think it's a nice distraction, because if you try to play guitar, you can't concentrate on anything else.

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