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FIRST PERSON

First person – Anja Schmidt and Long Li

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping early-career researchers promote themselves alongside their papers. Anja Schmidt and Long Li are co-first authors on 'Dia- and Rok-dependent enrichment of capping proteins in a cortical region', published in JCS. Anja conducted the research described in this article while a postdoc in Jörg Großhans's lab at Georg-August-University Göttingen, Germany. She is now a postdoc in the lab of Mark Peifer at Chapel Hill, NC, USA, investigating cell–cell interactions, mechanotransduction and cell–cell junction dynamics. Long is a postdoc in the lab of Jörg Großhans at Philipps-Universität Marburg, Germany, where he focuses on the regulation and interaction between microtubule and actin interaction.

Anja Schmidt

Long Li

How would you explain the main findings of your paper in lay terms?

A.S.: A meshwork of actin filaments and regulating proteins builds the dynamic actin cortex underlining the plasma membrane of cells. This cortex not only contributes to the stability of cells but also to contractility and division. We found that the actin filaments are differentially organized within the cortex of the one-cell fruit fly embryo although there is no physical barrier, leading to regions that have more filament ends than others. The depletion of a protein called Dia, which is responsible for the formation and elongation of actin filaments, leads to disruption of the cortical organization. The same is true if we inhibit the activity of Myosin, which can create tension by sliding on actin filaments.

L.L.: Actin is an element of the cell cytoskeleton, which is essential for multiple functions of different cells, such as muscle contraction and cell migration. In this paper, we used the *Drosophila* embryo as model organism to better describe the function and regulation of F-actin. We found that the actin network is a well-organized structure – the plus ends of F-actin accumulate at the intercap domain during syncytial interphase, F-actin is regulated by Dia and Myosin II, and both closely interact with the F-actin network.

Were there any specific challenges associated with this project? If so, how did you overcome them?

A.S.: This project was a long process; these mutant embryos and some results of the results presented accompanied me through my whole PhD program and postdoc, and we encountered a lot of dead ends. Furthermore, I moved to Chapel Hill before we could finish the manuscript. We overcame these challenges by staying curious and being open to new directions. Another important point was the ongoing collaboration with my co-author Long Li, who still performed experiments, and my PI, Professor Großhans, with whom I had frequent online meetings after I moved to the US, as well as my new PI Mark Peifer, who let me wrap up this work.

L.L.: The experiment with ROCK inhibitor injection and staining was a challenge for me, since I had to fix and stain the injected embryos. I practiced a lot before I started the experiment to make sure that the injection is appropriate and sufficient for the immunostaining. Also, during this project, we moved our lab from one city to another, and I had a lot of trouble to get used to the new

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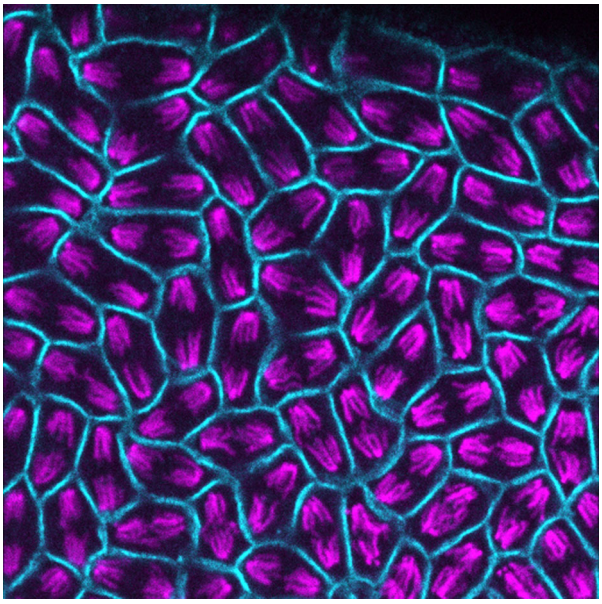

***Drosophila* embryo during mitosis.** DNA is in magenta, metaphase furrows in cyan.

working place, adjusting to the new lab and continuing our experiments as fast as we could.

When doing the research, did you have a particular result or 'eureka' moment that has stuck with you?

A.S.: When I looked for the first time at the capping protein pattern in wild-type as well as in *dia* mutant embryos. This was the missing link.

L.L.: When I wanted to check the localization of Dia–GFP in live embryos; I had been stuck for quite a while because I could not detect the specific signaling within the Dia–GFP fly stock, which had been generated by CRISPR-Cas9. Occasionally, I collected some embryos that were heterozygous or homozygous, and found specific signaling of Dia–GFP at the intercap domain during syncytial interphase in Dia–GFP homozygous embryos. I then realized that the expression of wild-type Dia can affect the localization of Dia–GFP in *Drosophila* syncytial embryos.

Why did you choose Journal of Cell Science for your paper?

A.S.: JCS publishes a wide variety of topics and has a diverse readership, which helps to promote articles across model organism borders. The submission process is straightforward, and I found the contact with the editor helpful and positive. Furthermore, JCS helps to promote articles and authors by interviews like this and social media features.

L.L.: Journal of Cell Science has a very good reputation and it is well known in cell biology. Our paper fits with the scope and readers of this journal.

Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

A.S.: The door of Professor Großhans is always open, not only for project-related discussions, help with presentations and grants, but also for advice on how to navigate the scientific landscape. And this went on even after I had left the lab. Professor Zhiyi Lv, who was a PhD student and postdoc in our lab. He encouraged me to ask questions, even if I thought they were stupid. Apart from him, I had a lot of, sometimes brief but helpful interactions with open-minded PIs who willingly answered questions on how to best handle my own scientific future.

L.L.: My supervisor Professor Dr. Jörg Großhans is very knowledgeable; I always learn a lot from him. He is super patient as well, when you have any question or are puzzled about an experiment, and he is always able to give me good guidance and suggestions based on his experimental experience.

What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

A.S.: After gaining my biology Diploma, I was a bit disenchanted and didn't want to pursue a career in science, which led me to work in the biotech industry for 3 years as a Marketing Manager before I found my way back into the lab. I needed to find out that this alternative was not for me, and I am glad that I found my way back to the bench. That time really helped me to figure out how to listen to my own gut feeling and to mentors, and provided me with a lot of experiences from which I still benefit.

L.L.: The mysteries of biology motivated me to pursue biological science as my career; I really want to know how creatures develop from one cell and how is this process is regulated and whether we can use the knowledge that we conclude from our experiments to serve our health. The most enjoyable moment is when I can get an expected experimental result, which is based on previous reports and knowledge, after multiple attempts.

What's next for you?

A.S.: I just gained a two-year Benjamin Walter stipend from the DFG in Germany supporting my work in the Peifer lab. I am not yet sure where my path will lead me after that.

L.L.: I would like to gain more knowledge about developmental biology.

Tell us something interesting about yourself that wouldn't be on your CV

A.S.: I love getting absorbed by completely science-unrelated things. There is no better way to not think about work than by sitting in a dark theatre for 2.5 h or training a horse.

Reference

Schmidt, A., Li, L., Lv, Z., Yan, S. and Großhans, J. (2021). Dia- and Rok-dependent enrichment of capping proteins in a cortical region. *J. Cell Sci.* **134**, jcs258973. doi:10.1242/jcs.258973.