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FIRST PERSON

First person – Shengnan Zheng

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. Shengnan Zheng is first author on 'The Cdc42 GTPase-activating protein Rga6 promotes the cortical localization of septin', published in JCS. Shengnan is a PhD student in the lab of Chuanhai Fu at University of Science and Technology of China, Hefei, Anhui, China, investigating how septin and microtubule cytoskeletons regulate cell septation and cell polarity.

Shengnan Zheng

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

The establishment of cell polarity is important for proper cell growth. In fission yeast, the GTPase Cdc42 is a master factor regulating cell polarity. GTPase-activating proteins (GAPs) are responsible for inactivation of Cdc42. In our study, we found that the Cdc42 GAP Rga6 has an uncharacterized function in promoting the cortical localization of the septin cytoskeleton. The septin cytoskeleton has been shown to function as physical barriers and/or scaffolds on the cell cortex. We further found that septin is enriched at the cortical regions adjacent to the growing cell tip and this localization pattern depends on Rga6. Therefore, we favor a model whereby Rga6 mediates proper cortical localization of the septin complex and works in concert with the septin complex to regulate cell growth.

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

I encountered multiple challenges when working on this project. One of the difficulties was to reconstitute the cortical localization of the two proteins (i.e. Rga6 and the septin complex) using liposomes. I spent around two years optimizing conditions for protein purification and looking for ideal conditions for liposome reconstitution. After multiple attempts using *E. coli*, insect cells and yeast cells, I was finally able to obtain high-quality Rga6 proteins from insect cells and the septin complex proteins from *E. coli*. Similarly, the process of finding a solution for liposome reconstitution with the purified proteins was not straightforward. After two years of experimenting, I finally found that the microsphere–liposome system developed previously worked well in my hands. Nonetheless, I have developed my skills in critical analysis and troubleshooting, and learned a lot during the past two years.

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

In an attempt to map the region(s) of Rga6 responsible for interacting with septin, I created a series of truncation mutants of Rga6 and tested their localization in cells expressing fluorescently marked septins. Finally, I was so happy to see that the localization patterns of the Rga6 variants were as expected and the data were consistent with the immunoprecipitation results. In addition, after years of trial experiments, I managed to reconstitute my findings in a test tube by using liposomes. When seeing the beautiful colocalization of Rga6 and Spn1 on the liposomes, I was excited and enjoyed the joy.

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

During my PhD study, I have read many septin and cell polarity related articles in Journal of Cell Science and found a great deal of insightful information from the published work. I also knew that Journal of Cell Science is a prestigious journal in cell biology. Therefore, we chose to publish our work in Journal of Cell Science and hope our work will be useful for the audience.

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

Yes. I was fortunate to be recruited to the laboratory of Dr Chuanhai Fu in the University of Science and Technology of China, one of the prestigious universities in China, as a PhD student about 5 years ago. Since then, my supervisor has been patiently teaching me not only experimental skills but also skills in troubleshooting and analyzing questions critically. Over the years, I have also benefited greatly from his encouragement, which have enabled me to develop confidence in tackling challenges independently.

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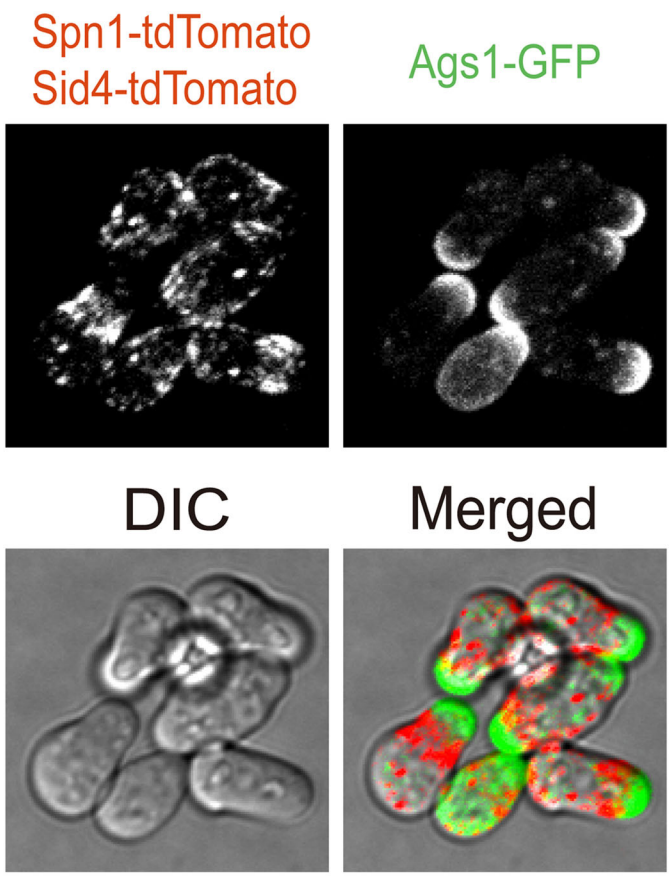

Maximum projection images of fission yeast spore cells. Cells express Spn1–tdTomato (marking the septin complex), Sid4–tdTomato (marking the spindle pole body) and Ags1–GFP (marking glucan synthase) in fission yeast. During germination, the Septin complex localizes to the cortical regions flanking the Ags1–GFP-decorated growing tip.

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?

I was fascinated by the complexity of the cell signaling pathways, the neuronal system, the cytoskeleton and organelles taught in biology classes when I was younger. Particularly, during my PhD study, I have addressed multiple projects and have seen the beauty of science. After successfully passing my qualifying exam, I decided to pursue a career in science.

Who are your role models in science? Why?

I think that Professor Paul Nurse is my role model. His success in using the model organism *S. pombe* to discover the key regulator of the cell cycle to me is an outstanding example of how to employ the power of yeast genetics to tackle important fundamental questions.

What's next for you?

Currently, I am a PhD student. After graduation, I would like to continue my journey in science. I would like to continue exploring how the cytoskeleton is organized and regulated within the cell, and how the cytoskeleton dictates cell fate.

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

In addition to enjoying the excitements of scientific discoveries, I like watching drama TV shows and listening to radio. Humor is another characteristic of mine.

Reference

Zheng, S., Zheng, B., Liu, Z., Ma, X., Liu, X., Yao, X., Wei, W. and Fu, C. (2022). The Cdc42 GTPase-activating protein Rga6 promotes the cortical localization of Septin. *J. Cell Sci.* **135**, jcs259228. doi:10.1242/jcs.259228