

FIRST PERSON

First person – Zhong-Qiu Yu

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. Zhong-Qiu Yu is first author on 'Visual detection of binary, ternary and quaternary protein interactions in fission yeast using a Pil1 co-tethering assay', published in JCS. Zhong-Qiu conducted the research described in this article while a postdoc in Li-Lin Du's lab at National Institute of Biological Sciences, Beijing, China. He is now a research associate in the lab of David Rubinsztein at Department of Medical Genetics, Cambridge Institute for Medical Research, UK, investigating protein degradation pathways and neurodegeneration diseases.

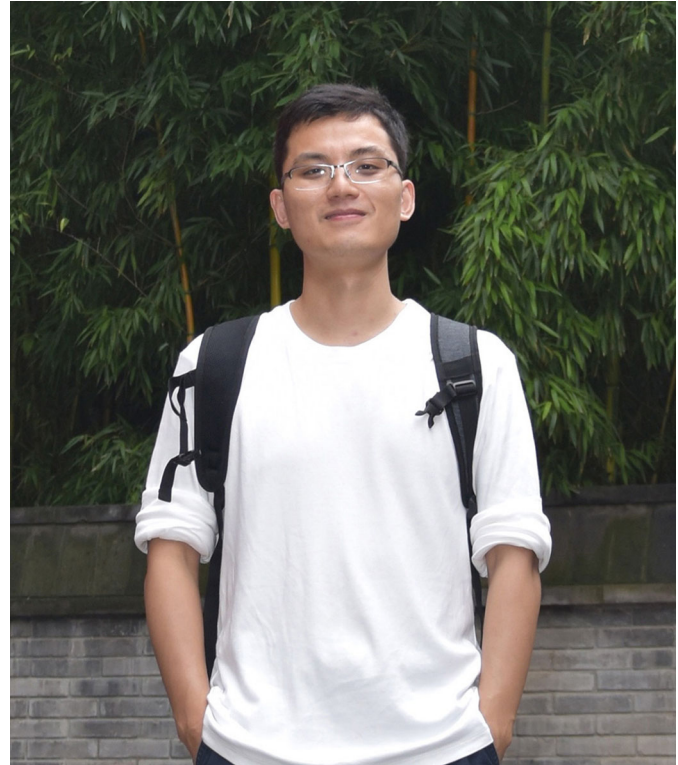
How would you explain the main findings of your paper in lay terms?

Cell functions are predominantly performed by protein–protein interactions. However, for the fission yeast *Schizosaccharomyces pombe*, a widely used and powerful model organism, a convenient approach to detect protein–protein interactions in living cells is lacking. We developed an imaging-based assay to detect protein–protein interactions in fission yeast. In this assay, we tether a bait protein to mCherry-tagged Pil1, which distinctively localizes to cortical filamentary structures, and the prey protein to GFP or CFP. If the prey protein interacts with the bait protein, the colocalization of fluorescence signals will be detected. Using this assay, we detect not only pairwise protein–protein interactions of cytosolic proteins and nuclear proteins, but also ternary and quaternary protein–protein interactions among the multiprotein complexes. Because of its simplicity and reliability in detecting protein–protein interactions, this assay has been used by colleagues in our laboratory for their research and I believe it will benefit more fission yeast researchers.

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

Before developing this Pil1 co-tethering assay, I had tried to survey how fission yeast Atg38 is integrated into PtdIns3K complex I using yeast two-hybrid and coimmunoprecipitation assays. We assumed that Atg38, as a specific subunit of the PtdIns3K complex I, would directly bind another PtdIns3K complex I-specific subunit, Atg14. However, I found that the interaction between Atg38 and Atg14 is influenced by all the other subunits of the PtdIns3K complex I, but still didn't confirm which subunit Atg38 directly binds. By analyzing the binary, ternary and quaternary interactions of the subunits of PtdIns3K complexes using the Pil1 co-tethering assay, it became clear that Atg38 is integrated into the PtdIns3K complex I by binding to Vps34.

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Zhong-Qiu Yu

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

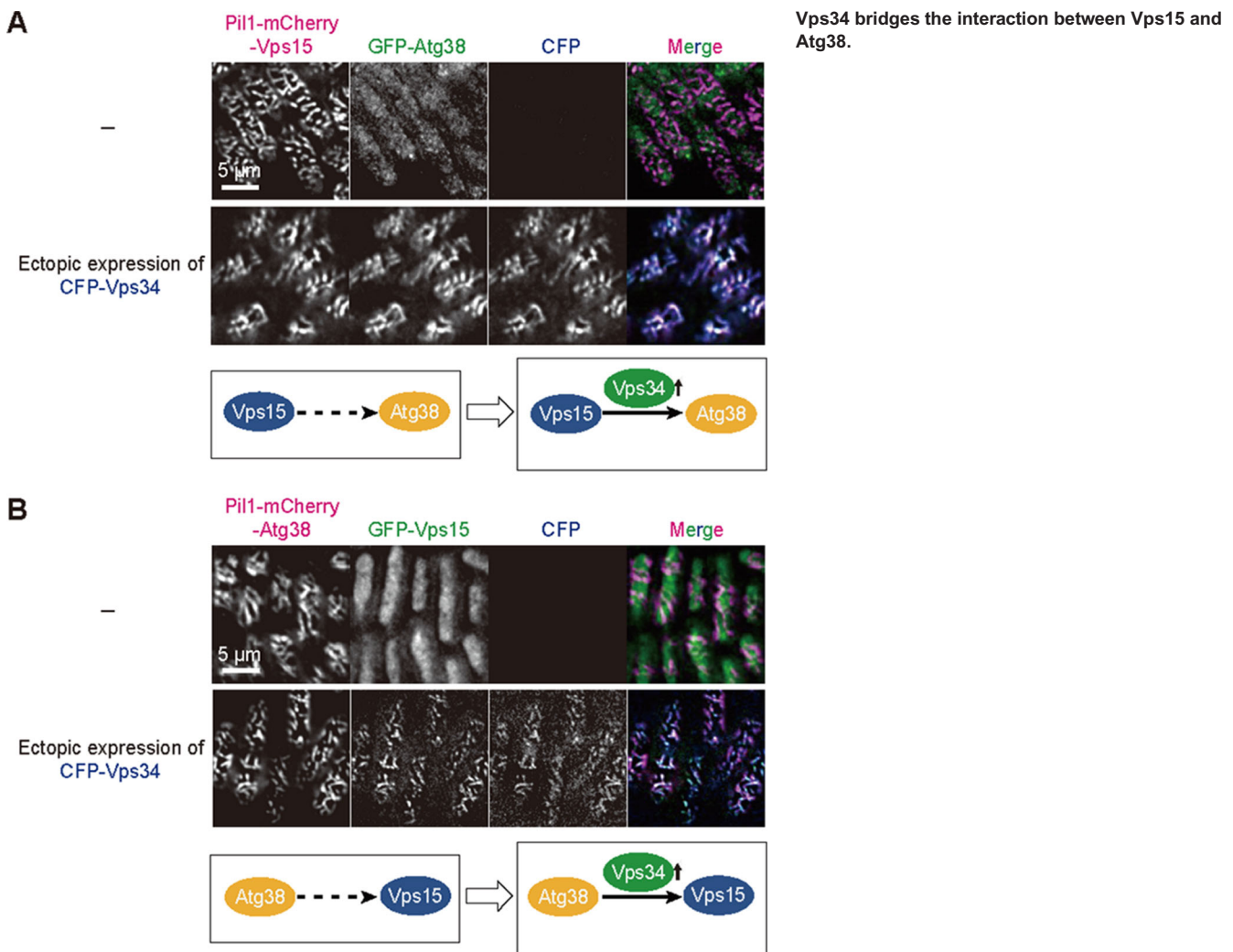
Journal of Cell Science has a broad audience and a good reputation. This journal has published a number of works using fluorescence microscopy or studies that developed tools for fission yeast research. We believe our work fits the scope of this journal and will meet as broad an audience as possible.

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

I deeply appreciate my PhD supervisor Dr Li-Lin Du and my BSc supervisor Dr Zhiping Xie. Dr Li-Lin Du is always full of enthusiasm for learning new things and never stops using them in his scientific research. Dr Zhiping Xie keeps his curiosity and encourages the people in his lab to develop their own curiosity. Their critical thinking and enthusiasm about science influenced me.

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?

When I was a grade two student in senior-high school and started to learn biology, I sensed that biology research could help develop methods to cure human diseases. At that time, I decided to pursue a career in biological sciences. The most interesting moments have been after seeing preliminary experimental results and thinking



about what they might mean, and then finding that they point towards a uniform model.

Who are your role models in science? Why?

Michael Faraday. Although receiving little formal education, he developed his potential to its fullest. His pursuit and persistence in science motivated me a lot.

What's next for you?

I'll continue to pursue a career in academia. I have just joined Professor David Rubinsztein's group as a research associate, hoping to do research related to neurodegenerative diseases.

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

I love to read philosophy books and watch superhero movies, which seems to be a contradiction. Actually, science is a thriving branch of philosophy and it gives people superpowers. To some degree, I think science is at the confluence of philosophy and superpowers.

Reference

Yu, Z.-Q., Liu, X.-M., Zhao, D., Xu, D.-D. and Du, L.-L. (2021). Visual detection of binary, ternary and quaternary protein interactions in fission yeast using a Pil1 co-tethering assay. *J. Cell Sci.* **134**, jcs258774. doi:10.1242/jcs.258774