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FIRST PERSON

First person – Yanze Jian

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping researchers promote themselves alongside their papers. Yanze Jian is first author on 'The fission yeast kinetochore complex Mhf1–Mhf2 regulates the spindle assembly checkpoint and faithful chromosome segregation', published in JCS. Yanze is a PhD student in the lab of Chuanhai Fu at the University of Science and Technology of China, Hefei, China, investigating checkpoint signalling in mitosis and meiosis.

Yanze Jian

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

Accurate chromosome segregation is important for the inheritance of genetic information, and abnormal segregation of chromosomes leads to diseases such as cancer. The kinetochore is a proteinaceous structure localized on the chromosome, connecting centromeres and microtubules and serving as a signalling hub for the spindle assembly checkpoint (SAC) during mitosis. Our study demonstrates the roles of Mhf2, a constitutive component of the kinetochore, in promoting kinetochore assembly and SAC signalling in fission yeast. Thus, the study provides insights into understanding the faithful segregation of chromosomes.

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

Yes, I encountered technical challenges. Specifically, precise comparison of the fluorescent signals between two groups of cells was technically challenging. My first attempt was to separately take microscopic images for two types of cells. However, due to inconsistent background noises, it was difficult to distinguish the subtle changes in fluorescent signals between the two groups. I then used microfluidic devices that contain several micro-wells, allowing for multiple cell populations to be simultaneously observed by microscopy. However, due to the microscopic size of the wells of the devices, they were unable to hold enough cells for statistical analysis. Finally, I developed a new method for the simultaneous observation of two types of cells in a mixture of samples. Specifically, lectin or MitoTracker Red was used to label wild-type cells, and these stained cells were then mixed with unstained mutant cells, followed by microscopic observation. This new method allowed me to conveniently detect even a small change in fluorescent signals between the two groups.

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

Yes, I was excited when the first piece of evidence showing that Mhf2 has a role in the SAC was collected. Before collecting the evidence, I made many experimental attempts but failed. In short, in my final experimental design, I used *nda3*-KM311 strains, which allow the arrest of cells at pre-anaphase by temperature and contain proper proxy proteins for reporting mitotic cells. Spinning-disk live-cell microscopy was then used to determine the number of mitotic cells after the release of the arrested *nda3*-KM311 cells. This experimental design led to a fruitful outcome showing that the absence of Mhf2 indeed causes a defect in the SAC. I felt excited because the small success demonstrated my capability to troubleshoot during my PhD study.

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

Journal of Cell Science is a cell biological journal with a long history. During my PhD study, I have read quite a lot of insightful articles published by JCS and benefited greatly from the readings. Therefore, I decided to submit my work to JCS and hope that the present work would also be insightful to the broad audience of JCS.

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

I have been fortunate to be a PhD student studying in the laboratory of Dr Chuanhai Fu at the University of Science and Technology of China. Dr Chuanhai Fu has always been available whenever help is needed. Under his supervision, I not only learned scientific knowledge, but also developed skills in critical thinking and scientific writing. In addition, his guidance allowed me to learn the importance of holding a positive attitude at work and studying independently.

Yanze Jian's contact details: MOE Key Laboratory for Cellular Dynamics & School of Life Sciences, Division of Life Sciences and Medicine, University of Science and Technology of China, Hefei, Anhui 230027, China.
E-mail: jianyanz@mail.ustc.edu.cn

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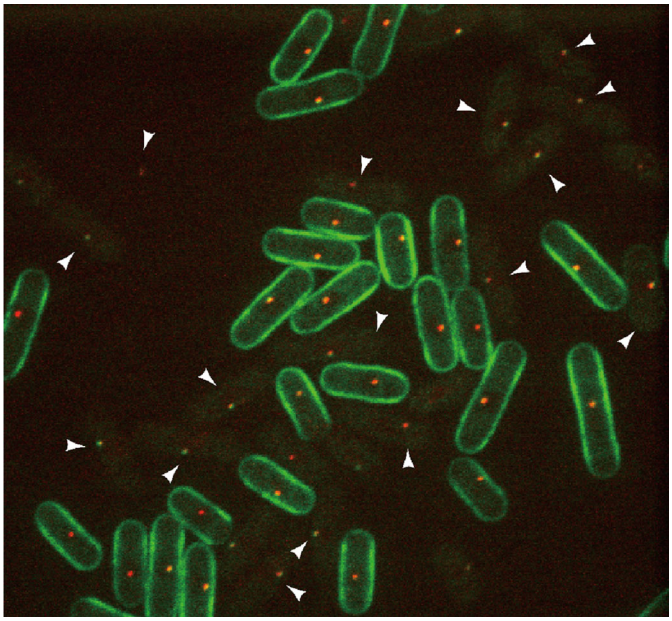

Maximum projection-images of *mhf2+* and *mhf2*Δ cells expressing Fta3–tdTomato and Sid4–GFP. Fta3 is the CENP-H homolog in fission yeast and is shown in red. Sid4–GFP (green) marks the spindle pole body, and lectin (green) marks the cell membranes of only *mhf2+* cells. The stained *mhf2+* cells were mixed with *mhf2*Δ cells and then analysed by live-cell microscopy. White arrowheads indicate *mhf2*Δ cells.

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?

Since studying biology in high school, I have been curious to understand how so many types of cells in an organism work in concert to maintain life. This long-term interest motivated me to pursue studies in biology. I felt that the most interesting moment in my scientific journey was the decision to embark on studying mitosis when I watched a beautiful live-cell movie of mitotic chromosome segregation.

Who are your role models in science? Why?

I admire all scientists who made extraordinary contributions to society. In particular, Marie Curie is my role model. She devoted herself to radium research, and her discoveries revolutionized physics. I was inspired by her determination and scientific spirits.

What's next for you?

I am a PhD student at the moment and would like to continue my journey in science. Currently, I am tackling a puzzle about the role of phosphorylation in regulating the SAC. After my PhD defence, I would like to pursue a postdoctoral study in cellular and molecular biology.

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

In my spare time, I like to go to the gym, as exercise makes me more energetic and enables me to focus on work. In addition, I love travelling and experiencing different cultures.

Reference

Jian, Y., Nie, L., Liu, S., Jiang, Y., Dou, Z., Liu, X., Yao, X. and Fu, C. (2023). The fission yeast kinetochore complex Mhf1–Mhf2 regulates the spindle assembly checkpoint and faithful chromosome segregation. *J. Cell Sci.* **136**, jcs260124. doi:10.1242/jcs.260124