

## FIRST PERSON

# First person – Yi-Wen Xu

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. Yi-Wen Xu is the first author on 'Maternal DCAF2 is crucial for maintenance of genome stability during the first cell cycle in mice', published in Journal of Cell Science. Yi-Wen is a PhD student in the lab of Heng-Yu Fan at the Life Sciences Institute, Zhejiang University, China, investigating the mechanisms of mammalian germ cell development and disease models relating to the female reproductive system.

### How would you explain the main findings of your paper to non-scientific family and friends?

In animals and humans, life begins with a fertilized egg, but it remains a mystery how development initiates after fertilization. We found that a protein called DCAF2, stored in the eggs of mice prior to fertilization, is used by embryos to safeguard development. When eggs are deficient in DCAF2, females have normal ovaries but are unable to reproduce because all embryos derived from these eggs die soon after development begins. Our study will help scientists to understand how genes and proteins from the mother influence the healthy development of embryos. This knowledge may give scientists insight into the reasons behind female infertility in some individuals and help to find a cure.

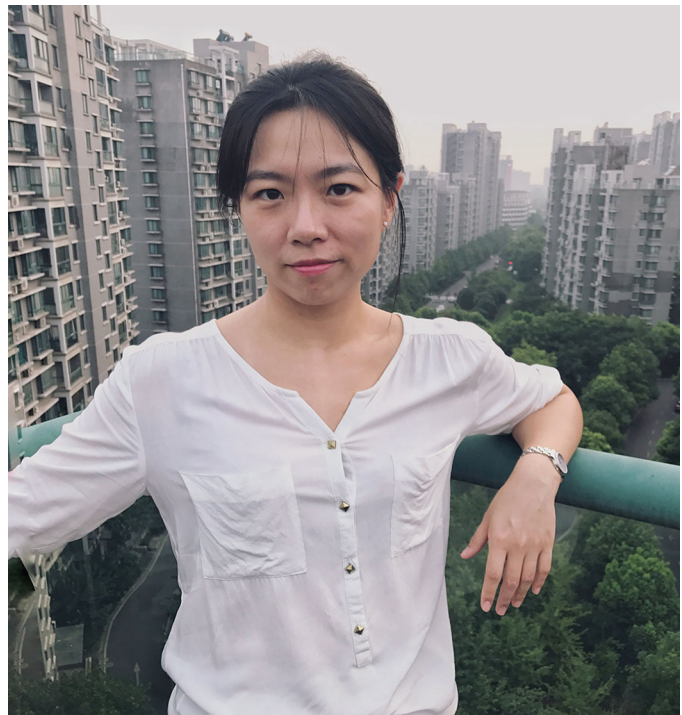
### Were there any specific challenges associated with this project? If so, how did you overcome them?

When I started setting up the mouse oocyte *in vitro* fertilization (IVF) system, the fertilization rate was not high enough. Additionally, BrdU staining across the stages of post-fertilization development was inconsistent. This meant that I was unable to get reliable measurements of DNA replication dynamics in wild-type and maternal *Dcaf2* knockout zygotes. To solve these problems, I studied a number of papers on BrdU staining and consulted some other researchers, which allowed me to modify my protocols and remarkably improve both fertilization rates and BrdU staining efficiency.

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

It was a great moment when I found that the maternal *Dcaf2* knockout zygotes failed to develop, because this observation proved that my project was physiologically meaningful and laid the foundations for all the following experiments. Observing the severe DNA damage in the pronuclei of maternal *Dcaf2* knockout zygotes was amazing, but also raised a number of new questions. Following the route opened by these observations, I was able to work out the mechanism by which maternal DCAF2 safeguards the zygotic genome.

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Yi-Wen Xu

### Have you had any significant mentors, and how have they helped you?

I am very grateful to my supervisor, Dr Heng-Yu Fan. The original idea of this study was inspired by Dr Fan, and he has always been there to help with all kinds of problems in the lab. What's more, we share an interest in succulent plants.

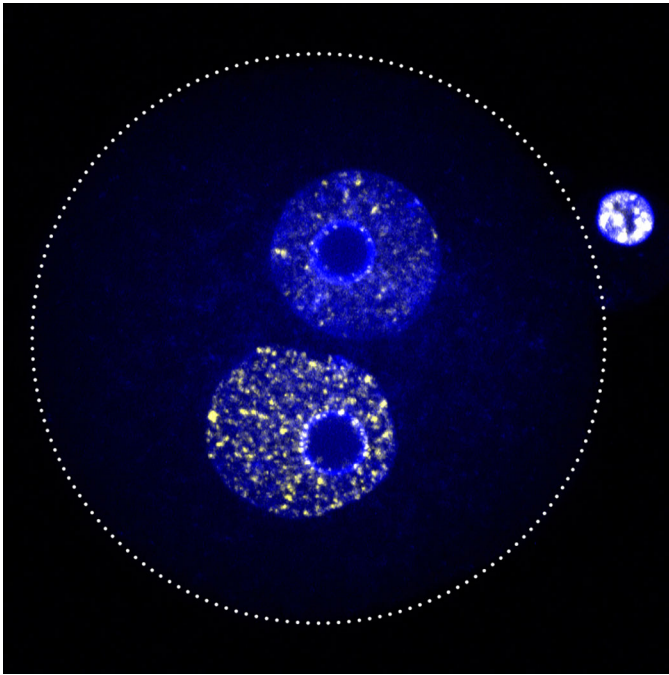
**“...curiosity is the key to keeping persistence active and real”**

### What's the most important piece of advice you would give first-year PhD students?

Always be curious. Although you cannot count on curiosity to bring you meaningful results, it may be the only thing that can drive you forward though all the hard work. Others may tell you that persistence is the only thing that matters, but in my opinion, curiosity is the key to keeping persistence active and real.

### What changes do you think could improve the professional lives of early-career scientists?

Active and positive communication with others can be a huge help to an early-career scientist's professional life. Some young researchers focus only on the protocol of the experiment that they are doing and the papers directly related to their projects, and don't pay enough attention to communication with peer scientists. This may lead to any issues they encounter taking



$\gamma$ H2A.X within foci (yellow) against the background of zygotic pronuclei (blue) shows how maternal loss of DCAF2 leads to substantial accumulation of DNA damage in zygotes.

quite a long time to solve. By discussing these problems and consulting with students and postdocs in their lab, even

people from other research labs, a solution is more likely to be found.

### “Active and positive communication with others can be a huge help to an early-career scientist’s professional life”

#### What’s next for you?

At present I’m studying the function and mechanism of DCAF2 in meiotic prophase I during spermatogenesis. My next step is to graduate from the PhD program and find a position in a research field that interests me.

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

I like to describe myself as a person who has quite a wide range of interests. In my spare time, I enjoy singing, listening to music, playing musical instruments and gardening. Though these hobbies may seem unrelated to science, they help me a lot in my research. For example, when performing tedious oocyte microinjection experiments, an enchanting song restores a peaceful mindset that helps me to carry on. When I’m frustrated by some failure, I like to take a look at the small lab garden and watch my lovely plants growing.

#### Reference

Xu, Y.-W., Cao, L.-R., Wang, M., Xu, Y., Wu, X., Liu, J., Tong, C. and Fan, H.-Y. (2017). Maternal DCAF2 is crucial for maintenance of genome stability during the first cell cycle in mice. *J. Cell Sci.* **130**, 3297-3307.