

FIRST PERSON

First person – Haruka Oda

First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping researchers promote themselves alongside their papers. Haruka Oda is first author on 'Actin filaments accumulated in the nucleus remain in the vicinity of condensing chromosomes in the zebrafish early embryo', published in BIO. Haruka is a postdoc in the lab of Professor Hiroshi Kimura, investigating the dynamics of nuclear actin in zebrafish early embryos.

Describe your scientific journey and your current research focus

I have been interested in science since I was a child, and I majored in life sciences at university. During undergraduate studies, I became interested in chromatin epigenetic modifications after taking a course on the topic and chose to analyze artificially induced DNA methylation in mice for my graduation research. As epigenetic modifications are reprogrammed through the germline, I became interested in gametogenesis, fertilization, and early embryonic development. In graduate school, I researched the unique structure and function of the early embryonic nuclei using the reconstituted system derived from *Xenopus laevis* unfertilized eggs. During my PhD, I focused on the high-density accumulation of actin in the nuclei of frog embryos, which led to my current work on analyzing actin dynamics in living cells using zebrafish.

Who or what inspired you to become a scientist?

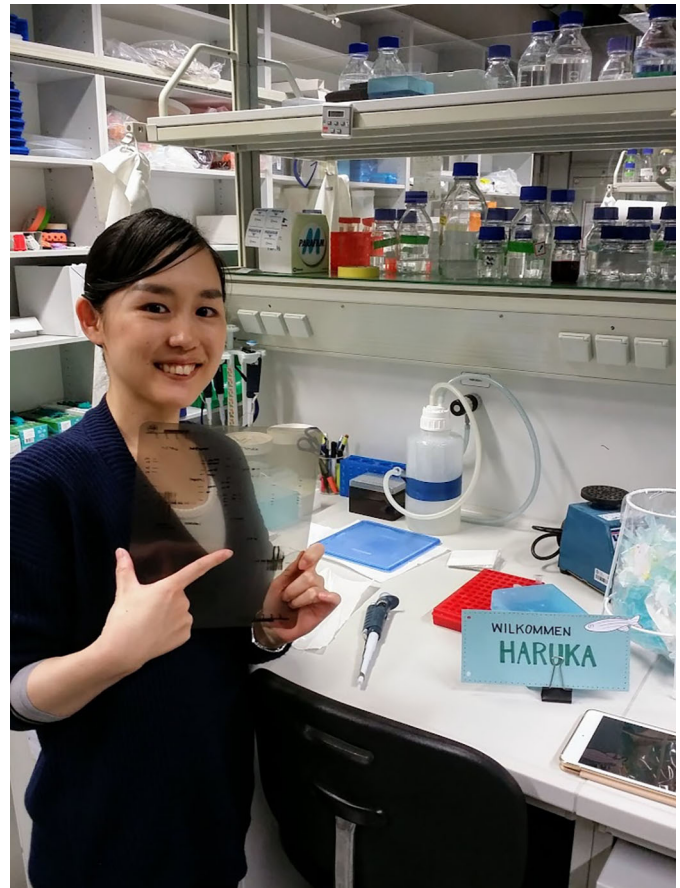
The people who inspired me to become a scientist were my parents and my science teacher in junior high school. Both of my parents are scientists, and they provided me with many opportunities to conduct small experiments and observe living organisms in a home environment that stimulated my intellectual curiosity from an early age. Unlike studying from textbooks, it was fascinating to witness changes in front of me, touch, and feel them. My parents also enjoyed conducting experiments and observations with me and taught me how enjoyable science can be. My science teacher in junior high school not only explained the science in the textbook but also devised various experiments to show us. Thanks to this teacher, learning science became fun for me, and watching my parents enthusiastically talk about their research, I decided to become a scientist myself.

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How would you explain the main finding of your paper?

Our paper demonstrated that actin, a major component of the cellular cytoskeleton, accumulates in the nuclei of zebrafish early embryos. Generally, there is very little actin present in the nuclei of differentiated cells, but the nuclei of early embryos of African clawed frogs and zebrafish contain high densities of actin. In this

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paper, I used live-cell imaging to reveal the dynamics of actin in the nuclei of early zebrafish embryos.

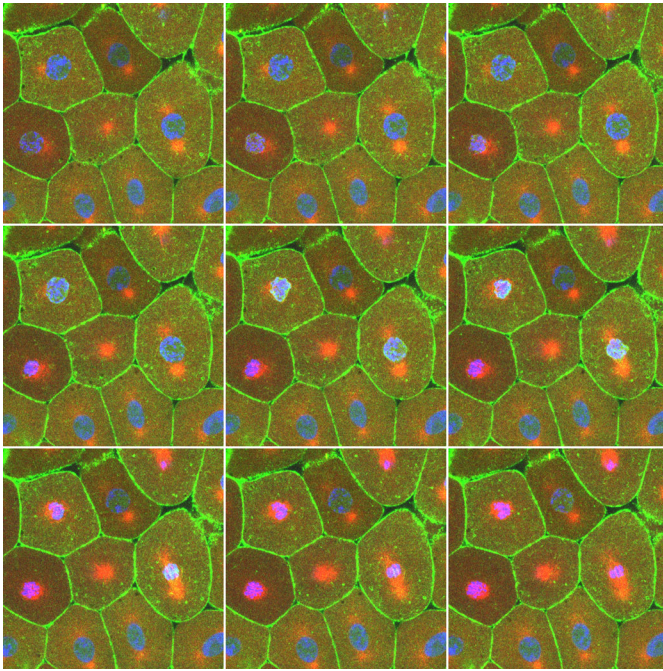
What are the potential implications of this finding for your field of research?

Unfortunately, this paper was unable to elucidate the clear roles of actin accumulation in the nuclei of zebrafish early embryos. However, as with African clawed frogs and mice, it has been demonstrated that filamentous actin also accumulates in the nuclei of zebrafish early embryos, suggesting that this is a common structural feature of animal embryonic nuclei. In mice, actin in the early embryo nucleus is important for chromatin organization and genome integrity. The dynamics of nuclear actin revealed in this study will serve as a basis for further understanding the role of nuclear actin.

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Which part of this research project was the most rewarding?

This study was based on my PhD work, which showed that actin accumulates at high density in the early embryos of



Actin accumulation in the nuclei of zebrafish early embryos observed by live-cell imaging. Actin probe: green, chromatin: red, tubulin: blue.

African clawed frogs. In starting this project, we had to first confirm whether actin also accumulated in the nuclei of early zebrafish embryos. If actin did not accumulate in the nuclei, our research plan would have been null and void. Therefore, when we confirmed the presence of nuclear actin in zebrafish early embryos, I was very excited as this meant our project could finally begin in earnest.

What do you enjoy most about being an early-career researcher?

As an early-career researcher, I thoroughly enjoyed working on my own project. It was a small project that did not align with the main theme of my lab, so it was a rare opportunity to have the freedom to conduct research. My PI (Professor Hiroshi Kimura) provided me with invaluable advice and support, and the lab members were very helpful as well. I also learned knowledge and techniques from the co-authors and received valuable materials. Many senior researchers encouraged me and gave me several chances to present at conferences. While I sometimes felt my shortcomings, I feel very fortunate to have been able to conduct research with support from many people.

What piece of advice would you give to the next generation of researchers?

If you have the chance, please seize it without hesitation. It's something I tell myself as well, but even if you feel like the burden is a bit heavy, don't be afraid to take on the challenge. You'll surely get good results. I think the next generation of researchers probably spent their student days during the pandemic and may have missed out on various opportunities. Please take pleasure in engaging with research communities and conferences, and find even greater enjoyment in the world of science.

What's next for you?

I will start my second postdoc career in the group of Professor Bernard de Massy at The Institute of Human Genetics in France very soon. I am looking forward to changing my research topics, methodologies, and materials, as well as learning new things.

Reference

Oda, H., Sato, Y., Kawashima, S. A., Fujiwara, Y., Pálffy, M., Wu, E., Vastenhouw, N. L., Kanai, M. and Kimura, H. (2023). Actin filaments accumulated in the nucleus remain in the vicinity of condensing chromosomes in the zebrafish early embryo. *Biol. Open*. 12, bio.059783.