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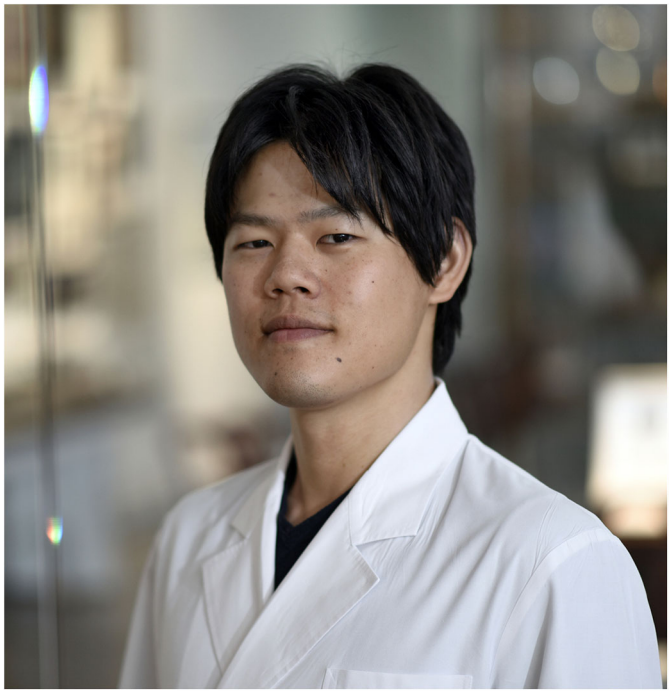
FIRST PERSON

First person – Yuki Ogawa

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. Yuki Ogawa is first author on 'Endogenously expressed Ranbp2 is not at the axon initial segment', published in JCS. Yuki is a postdoc in the lab of Matthew Rasband at the Baylor College of Medicine, Houston, USA, investigating how the cytoskeletal proteins are organized in neurons by using CRISPR/Cas9-based genome engineering.



Yuki Ogawa

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

Our lab is interested in the neuronal axon initial segment (AIS). The AIS is essential for the proper generation of axonal action potentials, and the regulation of neuronal polarity. Recently, Ranbp2, a protein known to localize at the nuclear membrane, was reported to localize at the AIS. We sought to determine the function of Ranbp2 at the AIS. However, we found the anti-Ranbp2 antibody that was used in previous studies and labels the AIS is not specific to Ranbp2. Instead, it cross-reacts with neurofascin, a well-known AIS protein. We performed new experiments that clarified Ranbp2 is not at the AIS.

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

Our lab has previously reported cases in which proteins reported to localize at the AIS or nodes of Ranvier were actually due to the use of spurious antibodies (e.g. phosphorylated IκBα and oMgp). These results were false-positives based on cross-reactivity against other proteins. Experiments of this kind require extensive controls, and we previously used gene-specific knockout mice. For the current study, we were unable to obtain the previously published Ranbp2 knockout animals due to the COVID-19 pandemic. However, with recent advances in CRISPR/Cas9-based genome engineering techniques, I was able to perform efficient knock-in experiments.

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

It was amazing for me when I found the cross-reaction of the Ranbp2 antibody for neurofascin. It was known that the Ranbp2 antibody used in the previous studies detects an ∼200 kDa protein although the molecular weight of full-length Ranbp2 is ∼358 kDa. I realized a molecular mass of ∼200 kDa is very similar with that of neurofascin and started to focus on this protein. Remarkably, I was able to map the five amino acids common in both Ranbp2 and Neurofascin that are both necessary and sufficient for antibody binding.

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

The first paper describing Ranbp2 at the AIS was published in Journal of Cell Science. I wanted to publish the present work in the same journal because I performed new experiments that clarify why Ranbp2 is not at the AIS. I believe it is important to correct the scientific literature when new information becomes available. This is how science progresses.

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

I would like to thank my PI, Matthew Rasband. He is a hard worker and has always been there to support me in my experiments and publications. I would also like to thank him for his help with my family as well.

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 have a bachelor's degree in pharmacy and am a licensed pharmacist. Through my training at the School of Pharmacy, I realized that there are many diseases that cannot be cured at all. This experience led me to work in the field of medical science. I am doing basic research now, and I believe that basic science is necessary for the development of medicine.

Who are your role models in science? Why?

One of my role models in science is Professor Hirotaka James Okano of the Jikei University School of Medicine in Japan. He was my PhD mentor. Dr James had been working in the USA for over ten years. I had heard about the differences between Japan and the USA, and how working in the USA had positively impacted his work and his life. I wanted to follow his success, and I am working in the USA and have now published my first paper while working in the USA.

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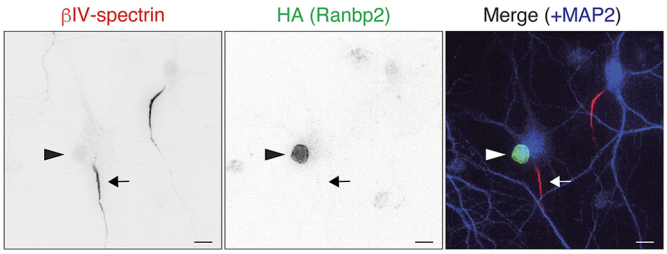

Signal of Ranbp2 is not detectable at the AIS as shown with knock-in experiments.

What's next for you?

I am working to discover new AIS-associated proteins and their functions using new methodologies including proximity biotinylation and CRISPR-dependent gene editing techniques. I am excited to publish this work.

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

I ride an electric bicycle to work every day.

Reference

Ogawa, Y. and Rasband, M. N. (2021). Endogenously expressed Ranbp2 is not at the axon initial segment. *J. Cell Sci.* **134**, jcs256180. doi:10.1242/jcs.256180