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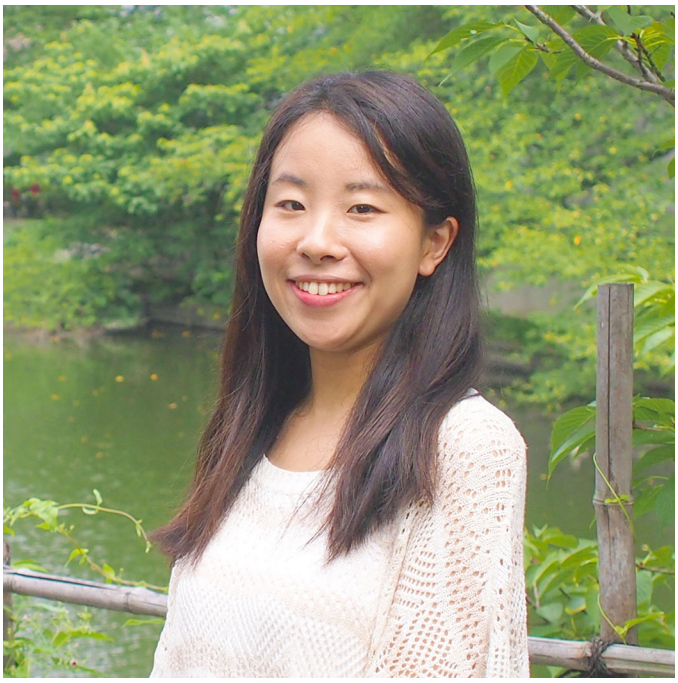
First person – Yoko Ito

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. Yoko Ito is the first author on 'The Golgi entry core compartment functions as a COPII-independent scaffold for ER-to-Golgi transport in plant cells', published in Journal of Cell Science. Yoko is a postdoctoral researcher in the Live Cell Super-Resolution Imaging Research Team in the lab of Akihiko Nakano at the RIKEN Center for Advanced Photonics, Wako, Saitama, Japan. She is studying the mechanisms of biogenesis and maintenance of the Golgi apparatus in plant cells.



Yoko Ito

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

The Golgi, one of the membrane-bound organelles inside eukaryotic cells, is known for its unique stacked structure. While almost all the eukaryotes have this structure, little is known about how it is formed and maintained. In our previous work, we found that only specific Golgi proteins localize to unknown punctate structures when the Golgi stacks are disassembled after treatment with a drug in tobacco cells. Because the Golgi stacks reassemble from these punctate structures after removal of the drug, we thought of them as the 'seeds' of the Golgi, and analyzed them further in the present study. By high-resolution live-cell imaging, we found that the punctate structures contain the proteins originating from the entry face of the Golgi stacks, and receive other Golgi components during Golgi regeneration. Therefore, we named the structure the Golgi entry core compartment (GECCO). Furthermore, the GECCO was revealed to form independently of the known Golgi trafficking systems, indicating that a novel transport route exists.

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

This work required very long time-lapse 3D imaging (for about 6 h) in high resolution, and minor differences in the environment during observations easily affected the cells and stopped their Golgi trafficking. We had no choice but to try many experimental patterns and find the best condition. This was a tough trial of live-cell imaging we had to face, but once we overcame it, the obtained images were very meaningful scientifically, and really beautiful.

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

Because I expected that the GECCO would disappear by inhibiting the only known endoplasmic reticulum-to-Golgi trafficking route, I was shocked by the opposite result. Unexpected data are often hard to deal with, but I think such a moment is one of the best parts of doing science.

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"Don't be disappointed by unexpected results. You might find something that nobody knows."

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

Related to the previous answer, this project itself started from an unexpected result when I was a graduate student. I originally planned to disassemble the Golgi stacks completely, but I couldn't do it at all, no matter how many times I tried. I was really confused at that time, but I received my PhD thanks to this data and I am still working on its continuation. Don't be disappointed by unexpected results. You might find something that nobody knows.

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

As many scientists say, I think job stability is necessary in academic fields. We cannot do creative work when we are busy worrying about the near future.

What's next for you?

I would like to do my next postdoc abroad. I am now planning to isolate the GECCO, identify what proteins and lipids localize there, and analyze how such molecules contribute to the formation of the Golgi stacks and plant life.

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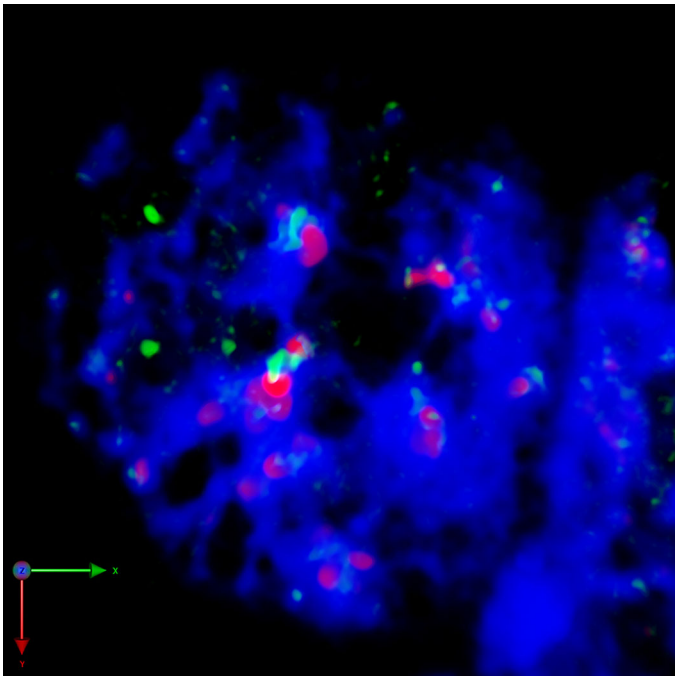

A 3D image of cis-Golgi (green), trans-Golgi (red), and the ER (blue) in tobacco cells.

Reference

Ito, Y., Uemura, T. and Nakano, A. (2018). The Golgi entry core compartment functions as a COPII-independent scaffold for ER-to-Golgi transport in plant cells. *J. Cell Sci.* **131**, jcs203893.