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FIRST PERSON

First person – Takeshi Harada

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. Takeshi Harada is first author on 'Palmitoylated CKAP4 regulates mitochondrial functions through an interaction with VDAC2 at ER–mitochondria contact sites', published in JCS. Takeshi is an assistant professor in the lab of Akira Kikuchi at the Graduate School of Medicine, Osaka University, Japan, investigating the role of CKAP4 at ER–mitochondria contact sites.

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

Intracellular organelles coordinate complex signaling, metabolism and gene expression mechanisms in the cell through functional or physical interactions with one another. Of the various combinations of interactions among organelles, that between the endoplasmic reticulum (ER) and mitochondria plays a pivotal role in cellular functions, including lipid transport, apoptosis control, energy metabolism and Ca^{2+} signaling. In our study, we found that an ER-resident protein called cytoskeleton-associated protein 4 (CKAP4; also known as CLIMP-63 and ERGIC-63) plays an important role in maintaining mitochondrial functions through binding to VDAC2 at ER–mitochondria contact sites. In addition, we found that deletion of the *CKAP4* gene decreased *in vitro* cancer cell proliferation under low-glucose conditions and *in vivo* xenograft tumor formation.

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

In normal culture conditions, CKAP4 knockout (KO) cells did not show any growth defect. We tested several culture conditions and finally found that CKAP4 KO cells could not grow as well as control cells in low-glucose conditions.

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

We first found that VDAC2 is a novel CKAP4-binding protein. VDAC2 is localized in the outer mitochondrial membrane. In contrast, CKAP4 is localized in the ER. We conceived the idea that the place where a mitochondrial protein meets an ER protein must be at ER–mitochondria contact sites. This idea prompted us to focus on mitochondrial structure and function in CKAP4 KO cells.

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

Journal of Cell Science is a peer-reviewed journal of high reputation in the field of cell biology research. Our research in my current lab is mainly based on cell biology. Our findings in this study fitted well with the scope of JCS. Moreover, nine other papers from our lab have also been published in JCS. Therefore, we chose JCS.

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Takeshi Harada

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

Since the time I was a graduate student, I have learned several lessons from my mentors. In particular, during my graduate studies, Dr Eisuke Nishida taught me his fundamental philosophy about science. Dr Atsu Aiba (my first postdoc mentor) taught me academic rigor. Dr Akira Kikuchi (my current boss) taught me the duty to be fulfilled as a researcher. Their ways of thinking about science are different, but are based on a solid philosophy of life.

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 always been interested in the origin of the human mind. My current studies may be far from that. However, I believe that no matter what they are, they will be connected somewhere.

"My motto is 'Everyone has something to teach, everyone has something to learn'".

Who are your role models in science? Why?

I do not have a particular person to name as my role model. However, I respect many scientists whom I have known directly or indirectly. My motto is 'Everyone has something to teach, everyone has something to learn'.

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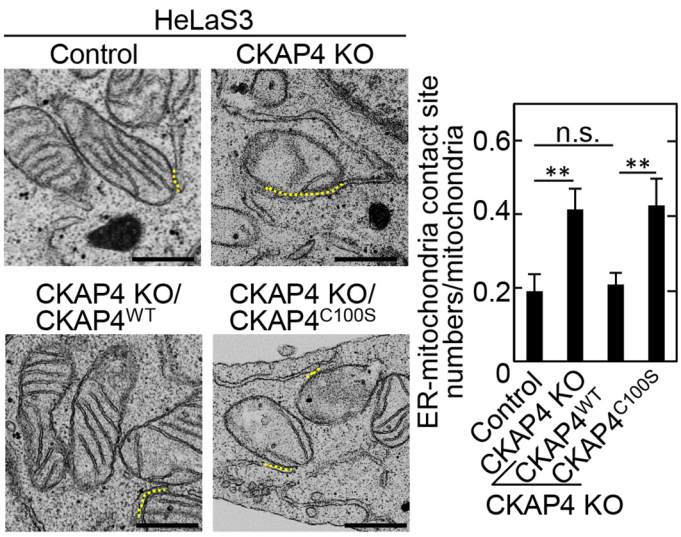

Palmitoylated CKAP4 regulates the formation of ER–mitochondria contact sites. ER–mitochondria contact sites are labeled with yellow dotted lines. Scale bars: 500 nm.

What's next for you?

Currently, I am working as an assistant professor in Osaka University, and, in the future, I would see myself as an independent researcher in the field of cell biology or neuroscience.

Reference

Harada, T., Sada, R., Osugi, Y., Matsumoto, S., Matsuda, T., Hayashi-Nishino, M., Nagai, T., Harada, A. and Kikuchi, A. (2020). Palmitoylated CKAP4 regulates mitochondrial functions through an interaction with VDAC2 at ER–mitochondria contact sites. *J. Cell Sci.* **133**, jcs249045. doi:10.1242/jcs.249045