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FIRST PERSON

First person – Laura Quirion

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping researchers promote themselves alongside their papers. Laura Quirion is first author on 'Mapping the global interactome of the ARF family reveals spatial organization in cellular signaling pathways', published in JCS. Laura is a PhD candidate in the lab of Jean-François Côté at the Montreal Clinical Research Institute, Montréal, Canada, investigating the dynamics of GTPase signaling.

Laura Quirion

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

To allow membrane trafficking and cytoskeleton remodeling, cells rely on a family of proteins called the ARF GTPases, which is composed of 29 members. Whereas research has primarily been focused on a few members of this family, we aimed to obtain a global view of the interacting partners associated with ARF proteins. To achieve this, we used a proximity-dependent biotin labeling assay (BioID) that allows the identification of proteins within a 10 nm radius of our protein of interest. This approach allowed us to predict the functional localization of 28 ARF family members, notably including the localization of ARL10 to mitochondria and peroxisomes. Moreover, we were able to reveal new proximity interactors of the understudied member ARL14, such as phospholipase D1 (PLD1) and the ESCPE-1 complex. We have shown that ARL14 is able to activate PLD1 to modulate lipid membrane composition and participates in cargo trafficking via the ESCPE-1 complex. Overall, our study serves as a valuable resource for the research community interested in exploring the interactors of ARF proteins.

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

Like any research endeavor, our project presented numerous challenges, two of which particularly stood out for me. The first one was working with a huge dataset. As it was my first time managing a project, I did not have a predefined strategy to tackle a project of this magnitude. Navigating through this process has taught me to be more organized and rigorous in my work, which are qualities that will stick with me for the rest of my career. The second challenge was to work on an understudied protein, where almost everything is unknown. We had to not only develop the basic tools to study our protein, but also perform highly advanced experiments. This often led to a circular problem where we questioned the accuracy of our results versus the efficacy of our tools. In the end, we were able to bypass the limits of this challenge and created new ways – for us and other scientific groups – to study this protein.

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

As a science enthusiast, I believe that each time you obtain a positive result there is a sense of excitement. For me, the 'eureka' moment during this project was when, after months of efforts to generate and screen our knockout cells, I saw the expected phenotype. It was incredibly satisfying to see everything finally come together. I was thrilled when we were able to reproduce this result in another cell type, thereby strengthening our findings.

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

We chose Journal of Cell Science to publish our paper for several reasons. Firstly, the journal holds a long-standing reputation in the field of cell biology, which makes it a trusted platform to disseminate research advancements. Secondly, we thought that our work aligned with the high caliber of research typically published by Journal of Cell Science, making it a good fit for our story. Lastly, we opted for this journal for its efficient review process. Overall, selecting Journal of Cell Science was a strategic decision aimed at maximizing the impact and reach of our study within the scientific community.

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

I am grateful for the invaluable guidance provided by great scientists who supervised me throughout this project. Additionally, I am immensely thankful for the senior PhD students in the lab, from whom I have learned the most profound insights beyond traditional supervision. By sharing similar personal and scientific experiences,

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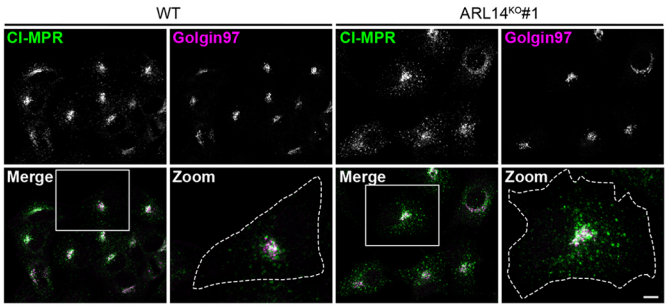

Co-immunostaining of Golgin97 and CI-MPR in wild-type and ARL14 KO A549 cells. Dotted lines delineate cell outlines defined using F-actin staining (not shown). Scale bar: 10 µm.

they were great examples to follow in the face of the challenges that a PhD represents, which is why I looked up to them. They are extraordinary people who, despite having faced many difficulties, have persevered with a great attitude and even better scientific thinking.

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?

Even from a young age, I have always been curious. Growing up, I was not sure whether I wanted to pursue a career in science. In fact, I wanted to be a dentist, but the more I learned about biology, the more I wanted to contribute to the advancement of science. It was after my first internship that it became obvious that science was my place. Being on the brink of the unknown, together with contributing to the expansion of the fundamental knowledge to help cure diseases, is what really motivates me to pursue my scientific career.

What's next for you?

As I am still figuring out what's the long-term plan for me, I am currently working on the last chapter of my PhD thesis, which is also centered around GTPase biology. I look forward to future collaborations and sharing my work at conferences.

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

I did horseback riding at a competitive level until the beginning of my PhD. Like in other sports, I learned many valuable traits – such as discipline, resilience and responsibility – that I can now translate to my research. Although my competitive years are over, I still ride frequently but mainly for fun. For me, it is a way to free my mind and put my life on hold for a moment.

Reference

Quirion, L., Robert, A., Boulais, J., Huang, S., Bernal Astrain, G., Strakhova, R., Jo, C. H., Kherdjemil, Y., Faubert, D., Thibault, M.-P. et al. (2024). Mapping the global interactome of the ARF family reveals spatial organization in cellular signaling pathways. *J. Cell Sci.* **137**, jcs262140. doi:10.1242/jcs.262140