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First person – Sara Hernández Pérez

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. Sara Hernández Pérez is first author on 'B cells rapidly target antigen and surface-derived MHCII into peripheral degradative compartments', published in JCS. Sara is a PhD student in the lab of Pieta K. Mattila at University of Turku, Institute of Biomedicine, Finland, investigating the role of Rab proteins and the actin cytoskeleton in antigen trafficking and B cell activation.

Sara Hernández Pérez

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

The B lymphocytes are an important part of our immune system, as they are responsible for the production of antibodies against pathogens. To produce antibodies against one specific antigen, B cells first need to recognize the antigen and then chop it into small fragments, or peptides. These peptides are then loaded on MHCII molecules and trafficked back to the plasma membrane for presentation to the T cells. Successful recognition and processing ('chopping') of the antigen is needed for a full immune response. Here, we show that antigen processing occurs fast and efficiently after internalization. The antigen is targeted to a specialized compartment with low pH and degradative capacity, together with MHCII, straight from the plasma membrane. We think these early compartments might support fast presentation of the antigen to get a faster immune response, or they might present different peptides to those presented by the later 'classical' compartments.

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

The main challenge associated with this project has been the small size of the B cells. They are about 10 µm in diameter (and primary cells from mice are even smaller) and the majority of that space is occupied by the nucleus. Therefore, a lot of testing and optimization was required to get good images and reliable colocalisation data between the different markers. Our group was experienced with imaging before starting this project, but it is incredible how much we learned along the way. Also, our institute has a great Cell Imaging Core and several groups in the building are doing advanced imaging, so we also had support from them.

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

We selected Journal of Cell Science because it is a journal with a good reputation that advocates open science. The revision process was fast and smooth, and we are extremely happy that our paper is now part of the special issue 'Cell Biology of the Immune System'.

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

I think I have been more than lucky with my supervisors. Pieta Mattila was my first supervisor when I started in the lab as an undergraduate student, and now she is my thesis supervisor, and Pedro Roda Navarro was my supervisor for a year, during my master's thesis. I would not be writing this article today if it weren't for their support and their help. I have learned so much from both of them – as well as from all the people in their lab – and hopefully I will still continue learning!

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 had some really good science teachers when growing up. I think it is impossible to find science boring as a kid if you have a good teacher who is passionate about the subject. Although I was not always very sure how to achieve it, I always knew I wanted to be a scientist and share that passion. It was really exciting when I finally had the opportunity to work in the lab as an undergraduate student not so many years ago.

Who are your role models in science? Why?

Although it might sound a bit cheesy, each one of the amazing people that work around me every day. They are the ones that keep me going.

What's next for you?

I am looking forward to start working on the follow-up projects from this paper. There are still many interesting things to discover about vesicle trafficking, and I would also like to look into their relationship with the cytoskeleton.

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

I enjoy travelling and cooking, and I am an amateur bird-watcher, especially since I moved to Finland and I get to walk a lot around the forest, beach and lakes (no mountains though).

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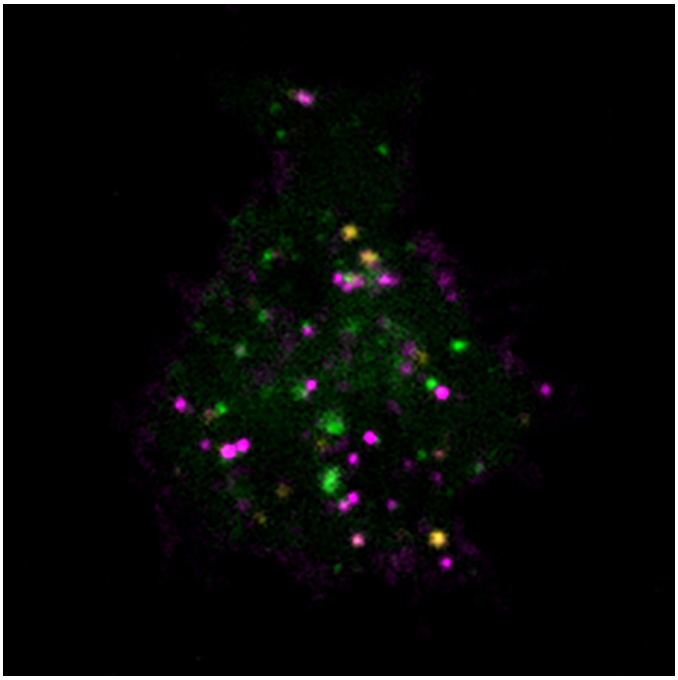

Live-cells images of B lymphocytes transfected with GFP–Rab5, loaded with LysoTracker and activated with anti-IgM-RRx.

Reference

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