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FIRST PERSON

First person – Gabriella Robertson

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. Gabriella Robertson is first author on 'DRP1 mutations associated with EMPF1 encephalopathy alter mitochondrial membrane potential and metabolic programs', published in JCS. Gabriella is a PhD candidate in the lab of Vivian Gama at Vanderbilt University, Nashville, USA, where her research interests center on the role of organelle dynamics and metabolic function in early neurodevelopment and disease.

Gabriella Robertson

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

EMPF1 is a devastating rare disease that impacts brain development and has no cure or effective treatment. The genetic change associated with the disease is known to affect the shape of the mitochondria and peroxisomes, which are organelles in the cell that metabolize different fuels and provide energy. However, it is not well understood how changes in mitochondrial and peroxisomal shape lead to EMPF1. This work showed that EMPF1 patient mutations impact metabolite production independently of the mitochondria's ability to generate energy for the cell.

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

This project included several experiments with live imaging of mitochondria and peroxisomes. Given the role of mitochondria in apoptosis, mitochondrial morphology and dynamics can rapidly change under even mild cellular stress, such as the phototoxicity associated with live imaging. To ensure that our results were representative of homeostatic conditions, we needed to meticulously troubleshoot the live-imaging conditions. Additionally, imaging peroxisomes can be challenging due to their size. Super-resolution microscopy must be used to accurately analyze peroxisome morphology.

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

This project centered around using and analyzing patient-derived cells, which I've always viewed as both a privilege and responsibility. After sharing the original project as a preprint, patient families reached out and shared that they were encouraged to see more research being done on this rare disease. Although this work is basic cell biology and not immediately translational, the excitement and encouragement from patient families has stuck with me and continues to motivate my research.

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

I chose Journal of Cell Science for this paper because I had previously read several rigorous papers in this journal. I felt that it was a good fit for my paper because my paper is at the interface of basic cell science and disease modeling.

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

Over the course of my time in science, I have been lucky to have several excellent mentors who provided more than just scientific supervision. After my undergraduate degree, I worked in the lab of Dr Evangelos Kiskinis. As a first-generation student, I loved science but was unsure if pursuing a PhD was for me. However, my mentor, Evangelos, showed unwavering faith in me and helped me realize that I am more than capable of being an independent researcher. Beyond direct supervisors, I have benefitted from excellent near-peer mentorship from graduate students and postdoctoral fellows throughout my career in science. Their guidance inspired me to remain passionate amid obstacles and to have confidence in my own scientific ideas from an early career stage.

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 been fascinated by nature and animals all my life, so I naturally gravitated toward science in school. As I got older, I became interested in medicine but quickly realized how little we actually know about the intricacies of the human body. This led me to pursue a career in science with the goal of merging both basic biology and disease research. Some of my favorite moments in science have been sharing my research with others at conferences and meetings because I always leave with new ideas. I especially

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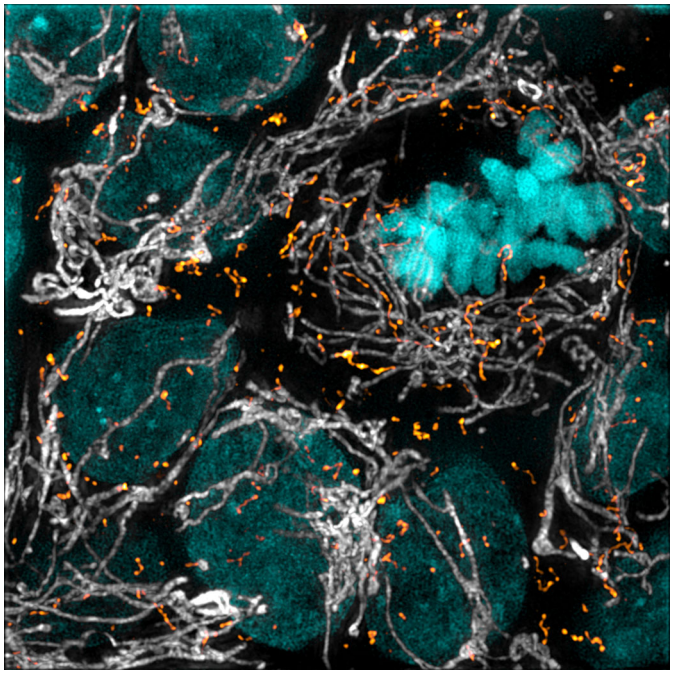

Elongated mitochondria (grey) and peroxisomes (orange) in EMPF1 patient cells.

love sharing my research with undergraduate students. Since they are unclouded by scientific biases, they often ask the most profound questions.

Who are your role models in science? Why?

My PhD supervisor, Dr Vivian Gama, is one of my role models in science because she produces rigorous, impactful research while remaining kind and passionate. Vivian prioritizes the needs and interests of her mentees above her own. Importantly, she doesn't hesitate to pull back the curtain on the often hidden innerworkings of managing a lab and navigating academia as an underrepresented woman in the field.

What's next for you?

I plan to finish my PhD in about a year from now. After defending my thesis, I plan to pursue a postdoctoral position at the intersection of neurodevelopment and metabolism. My long-term goal is to lead my own research group and continue to study neurodevelopment.

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

I am an avid reader. My favorite genres are historical fiction, fantasy and science fiction. I'm also a huge animal lover. My favorite animals are capybaras, and I'm currently planning a trip to meet them in their native habitat.

Reference

Robertson, G. L., Riffle, S., Patel, M., Bodnya, C., Marshall, A., Beasley, H. K., Garza-Lopez, E., Shao, J., Vue, Z., Hinton, A., Jr. et al. (2023). DRP1 mutations associated with EMPF1 encephalopathy alter mitochondrial membrane potential and metabolic programs. *J. Cell Sci.* **136**, jcs260370. doi:10.1242/jcs.260370