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FIRST PERSON

First person – Emma Lacroix

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. Emma Lacroix is first author on 'Evolutionary conservation of systemic and reversible amyloid aggregation', published in JCS. Emma is a PhD student in the lab of Dr Tim Audas at Simon Fraser University, Burnaby, Canada, investigating stress-induced physiological amyloid aggregation.

Emma Lacroix

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

When human cells are exposed to harsh environmental conditions, such as high temperature or acidity, they form protein aggregates, or 'clumps', called amyloid bodies (A-bodies). The proteins within these structures adopt a folding shape called the amyloid conformation, which has historically been associated primarily with neurodegenerative diseases like Alzheimer's and Parkinson's disease. However, unlike the harmful aggregates, A-bodies function to protect the cell by conserving energy during periods of cell stress. Additionally, A-bodies are rapidly disassembled once the initial stressor has been alleviated, whereas disease-associated aggregates are not reversible. In this work, we found that A-bodies form in diverse organisms from human to yeast, suggesting that they have been retained throughout evolution and likely play an important role in an organism's adaptation to environmental stress. We also found that the function of A-bodies appears to be different in flies and yeast compared to more complex organisms. Overall, we have shown that A-bodies appear to be evolutionarily conserved structures that form in response to severe but sub-lethal environmental stressors.

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

We used a variety of cell and organismal models in this paper that had not been studied in our lab before. This made it challenging to optimize the A-body detection techniques for these new systems. We received an abundance of insight from members of our department who had experience using these models, for which we are very grateful.

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

Identifying A-body formation in egg chambers dissected from living flies was a memorable moment from this project. Before this experiment, observable A-body formation had only been induced in cultured cell lines. This experiment demonstrated the ability of a living organism to form A-bodies in response to a non-lethal stressor, which highlighted the prevalence of these structures in a physiological setting. This experiment also expelled any notions that A-body formation could be an artifact of the cell culture model, which was very exciting for our research.

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

We chose Journal of Cell Science to reach a broad audience of cell biologists. JCS has published a variety of very interesting papers that look at cellular stress response pathways, so we thought this journal would be a good fit for our work.

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

My current supervisor Dr Tim Audas has been a great mentor. I initially worked in his lab as an undergraduate student during an independent study semester, and his guidance motivated me to pursue my PhD in the field.

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 was always interested in understanding the molecular basis for science experiments that were demonstrated in class. In high school, I once forgot my house keys and was locked outside for two hours with nothing to do except read my biology textbook. To my surprise, I found it very interesting, and I performed much better on the next exam. Science became my favorite topic, and pursuing research was the next step in trying to understand new and interesting processes.

What's next for you?

I hope to finish my PhD in the next few years and continue in the field of cell biology research.

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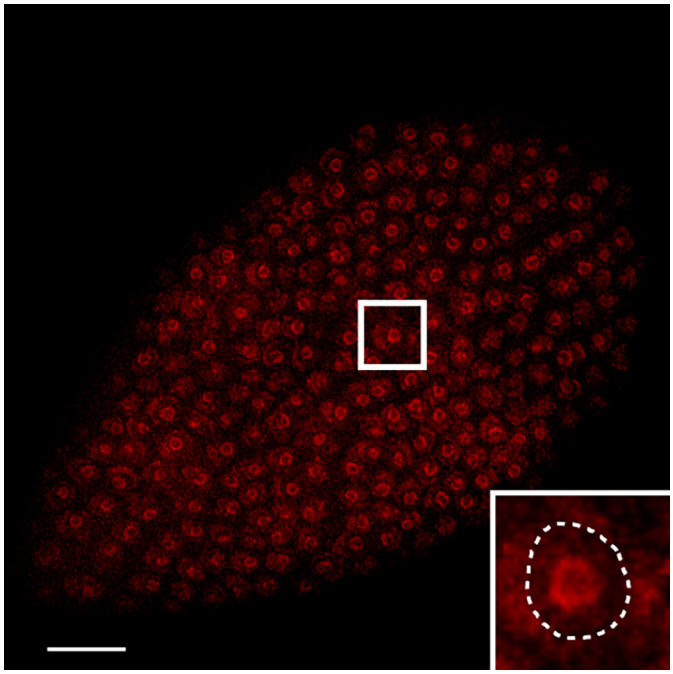

Congo Red staining of a stage 7 egg chamber from adult *Drosophila melanogaster* heat shocked at 38.5°C for 0.5 h. A single nucleus is highlighted in the inset.

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

Living in British Columbia, Canada, I spend most of my weekends hiking through the many local mountain peaks, and recently started doing multi-day backpacking trips. I also have a thriving snow globe collection and was just gifted my fortieth addition, from Belgrade.

Reference

Lacroix, E., Pereira, L., Yoo, B., Coyle, K. M., Chandhok, S., Zapf, R., Marijan, D., Morin, R. D., Vlachos, S., Harden, N. et al. (2021). Evolutionary conservation of systemic and reversible amyloid aggregation. *J. Cell Sci.* **134**, jcs258907. doi:10.1242/jcs.258907