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First person – Giovanna Lucrecia Gallo and Ayelen Valko

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. Giovanna Lucrecia Gallo and Ayelen Valko are co-first authors on 'A novel fission yeast platform to model *N*-glycosylation and the bases of congenital disorders of glycosylation type I', published in JCS. Giovanna conducted the research described in this article while a PhD student in Cecilia D'Alessio's lab at Fundación Instituto Leloir, Buenos Aires, Argentina. She is now a postdoc in the lab of Nora Lopez at Centro de Virologia Humana y Animal, Buenos Aires, Argentina, investigating the biological mechanisms underlying virus–host cell interactions, intracellular viral strategies to survive host immune responses and the control mechanisms displayed by the host. Ayelen conducted the research described in this article while a postdoc in Cecilia D'Alessio's lab. She is now a postdoc in the lab of Sebastian Schuck at Heidelberg University Biochemistry Center, Germany, investigating the underlying mechanisms of micro-ER-phagy, an autophagic process that is essential for elimination of the ER during ER stress.

Giovanna Lucrecia Gallo

Ayelen Valko

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

G.L.G. and A.V.: Proteins are not only bricks used for building life, but are also the main catalysts in biological systems. To properly fulfill their role, they need to acquire specific spatial conformations in certain locations within the cell through a process called protein folding. *N*-glycosylation is the main cellular process that assists protein folding. This process consists of the incorporation of 'sugar trees', complex carbohydrates formed by multiple units of glucose and mannose, into proteins. Failures in this process in humans can lead to a set of diseases called congenital disorders of glycosylation. In this work, we introduce the fission yeast *Schizosaccharomyces pombe* as a useful biological model for the study of these pathologies. By combining an *N*-glycosylation biosensor with a library of mutant yeast strains that mimic the set of mutations observed in human patients, we found that glucose composition has a much stronger effect on the function of the sugar tree than mannose. Thus, fission yeast is a promising model organism for exploring fundamental aspects of protein synthesis and *N*-glycosylation that are essential to the treatment of the abovementioned human genetic diseases.

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

G.L.G. and A.V.: We faced different challenges during the course of this research project. In general, the integration of results obtained using very different sets of techniques into a coherent biological scenario was a huge challenge. In particular, while analyzing the lipid-linked oligosaccharide (LLO) profiles of the *S. pombe* mutant library, we found unexpected glycans in many cases. The biological interpretation of these observations required a sort of mathematical processing that was beyond the set of skills that we had at the time, and thus we needed to incorporate them into our toolbox.

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

G.L.G. and A.V.: Actually, we didn't have a lot of 'eureka' moments. This work was built gradually, step by step, with a high

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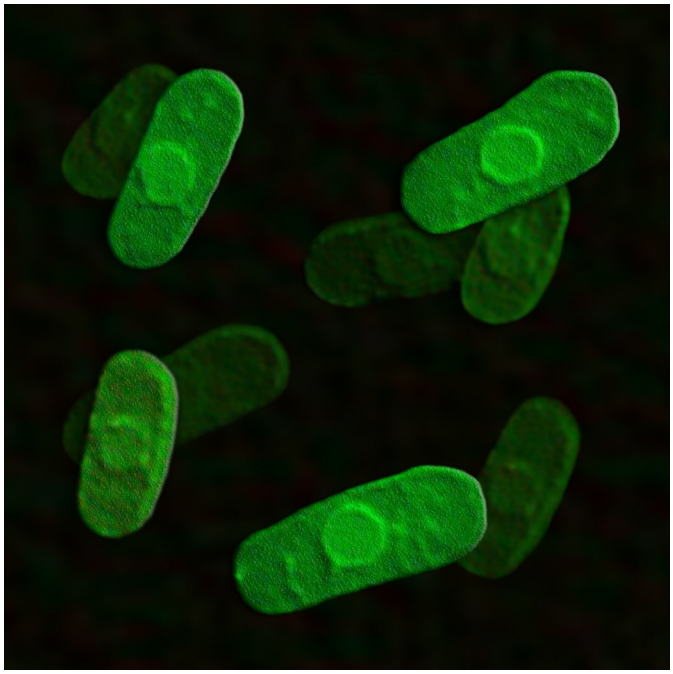

***S. pombe* cells expressing a GFP-based *N*-glycosylation sensor.** Different filters were applied to create a three-dimensional effect.

level of analysis behind it, so there were no remarkable breakpoints. Perhaps one moment that accelerated the analysis was the application of a deconvolution algorithm to identify the LLO species that were synthesized by the different strains in our *S. pombe* mutant library.

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

G.L.G. and A.V.: Journal of Cell Science can trace its origin back more than 150 years, and through all these years it has provided cell biologists with a reliable publishing platform for sharing the latest research and advances. Avidly read by the whole community, its editorial standards certify the scientific quality of the works published there. Therefore, it was with great pleasure that we submitted our research to be considered for publication in this journal, and we were actually quite thrilled when we knew that it had been accepted.

It should also be noted that the possibility of publishing with no fees was also relevant to us, as this research was carried out in a developing country where funding is usually scarce.

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

G.L.G. and A.V.: Our mentor was undoubtedly our PhD and postdoc director, Ceci (Dr Cecilia D'Alessio). She was always open for discussions that ranged from the latest theoretical ideas proposed in the field to the most mundane technical details. Actually, she has never abandoned bench work, which kept her very close to us throughout the whole research.

Dr Armando Parodi is among the most intelligent people we've ever met. Just by looking quickly at the design of an experiment, he can predict the results and identify all the possible sources of error. Moreover, he is a source of inexhaustible wisdom, so spending time listening to him really improved everyday life in the lab.

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?

G.L.G.: I consider my main motivation to be curiosity. I've always been a very curious person, interested in different fields such as biology, astronomy, history and art. More specifically, I was always very interested in human diseases, especially infectious ones. When I realized that I could investigate the origin of a disease at a molecular level, understand what was behind a disease and explain it at the most basic level, I had no doubt that it was going to be my passion.

A.V.: When I was around 10 years old, my dad gave me a small microscope, which I used to look at water samples and fragments of leaves. I remember my excitement seeing for the first time this amazing tiny world through the lens of this enigmatic artifact. I knew then that I wanted to pursue a scientific career, to continue exploring that wild, huge and unknown microscopic universe. And now, as a fully-grown scientist, every time I look through the microscope, I relive that very same sensation I had as a child. This feeling of perhaps being the first person to witness the mystery of a particular subcellular landscape or a biological process is my daily inspiration to go forward.

Who are your role models in science? Why?

G.L.G.: For me, the most inspiring researchers are those who work every day, arrive early at the lab, and spend lots of hours reading papers, analyzing experiments and thinking up new hypotheses for unexpected results (the daily lab routine). People who keep their minds constantly updated challenge me to be better as I learn from them.

A.V.: There are a large number of scientists from different disciplines and historical moments whose work has inspired me deeply: Richard Feynman, Carl Sagan, Lynn Margulis, Barbara McClintock and Giordano Bruno, to name a few. But among the scientists I have met in person, I would like to highlight Dan Klionsky, from Michigan University. They are role models for me because they have conveyed to the general public the idea that questioning and dissecting a phenomenon does not mean destroying its essence. A better understanding of the complexity of nature and its principles just contributes to our comprehension of its underlying beauty.

What's next for you?

G.L.G.: Within my postdoc in virology, I am planning to spend a short period at the University of San Diego, in California. After finishing my postdoc, I aim to get my own position as a research scientist in Argentina.

A.V.: I joined Dr Sebastian Schuck's laboratory at Heidelberg University a year ago as a postdoctoral fellow, where I am using budding yeast as a model organism to study micro-ER-phagy. Afterwards, I plan to pursue an academic career so I can keep studying the molecular mechanisms behind my favorite biological process: autophagy.

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

G.L.G.: I love spending my free time inside a museum. I can't think of a better plan for a weekend afternoon than spending

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hours looking at artworks – learning from them who we are, where we come from and what makes human beings what we are.

A.V.: Besides being a cell biologist, I am also an artist. For me, art has always been as important as science. I find that art is a useful way of conveying my appreciation of life and nature, and sharing with the general audience the beauty hidden inside a cell, which my work as a scientist allows me to capture. If you're interested, you can explore my science-inspired artwork by visiting my personal webpage: ayelenvalko.com.

Reference

Gallo, G. L., Valko, A., Aguilar, N. H., Weisz, A. D. and D'Alessio, C. (2022). A novel fission yeast platform to model *N*-glycosylation and the bases of congenital disorders of glycosylation type I. *J. Cell Sci.* **135**, jcs259167. doi:10.1242/jcs.259167