

FIRST PERSON

First person – Alba Delrio-Lorenzo

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. Alba Delrio-Lorenzo is first author on 'Sarcoplasmic reticulum Ca^{2+} decreases with age and correlates with the decline in muscle function in *Drosophila*', published in JCS. Alba is a PhD student in the lab of Javier García-Sancho and María Teresa Alonso at the Instituto de Biología y Genética Molecular (IBGM), University of Valladolid, Spain, investigating the molecular mechanisms implicated in aging, particularly muscle aging.

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

Aging still remains a mystery of biology and one of the tissues that suffers the most in aging is skeletal muscle. Cytosolic Ca^{2+} ions are the intracellular second messengers involved in almost every physiological process, including muscle contraction. The sarcoplasmic reticulum is the store of Ca^{2+} in the muscle cell, and it releases Ca^{2+} to the cytosol when the muscle contracts. We hypothesized that the store of Ca^{2+} in the sarcoplasmic reticulum could be altered in aging. We wanted to address this *in vivo*, and we chose the *Drosophila* model. We also needed to develop a new methodology to accurately measure the levels of the ionic Ca^{2+} inside the sarcoplasmic reticulum of flies *in vivo*. For this purpose, we generated transgenic flies that express the GAP3 Ca^{2+} sensor, which allowed us to measure the Ca^{2+} in the living flies of different ages. We discovered that old flies have tenfold less Ca^{2+} than young flies and this correlated well with the loss of muscle function.

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

One aging experiment can take several months and the old flies are really fragile, so the challenge was to have a large enough number of flies to perform the climbing experiments and the calcium measurement. We overcame this by starting with samples large enough to compensate for the flies that died due to severe sarcopenia.

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

I will always remember the moment when I got the band for SERCA protein in the western blot. It was not easy to obtain specific antibodies for *Drosophila*, in fact after trying with many other commercial antibodies, the SERCA and the RyR antibodies used for the western blots were generous gifts from other researchers. So, when I was exposing the membrane to the autoradiography film in a dark room and actually saw the signal I went directly to the laboratory to share my result with everybody. I was so excited that there are pictures of me jumping for joy. From that moment, the



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western experiments went perfectly. It was also very exciting analysing the results. We wanted to do it in a blinded way, so I did not know which samples were from young flies and which ones were from the old flies. When the final result showed the reduction of the protein in the muscle, we started asking new questions that led to new experiments.

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

Because it is a well-recognized journal in the cell biology field, and we believed our research would reach a broad audience. Besides, it is a journal from a not-for-profit publisher and the reviewing process is quite friendly.

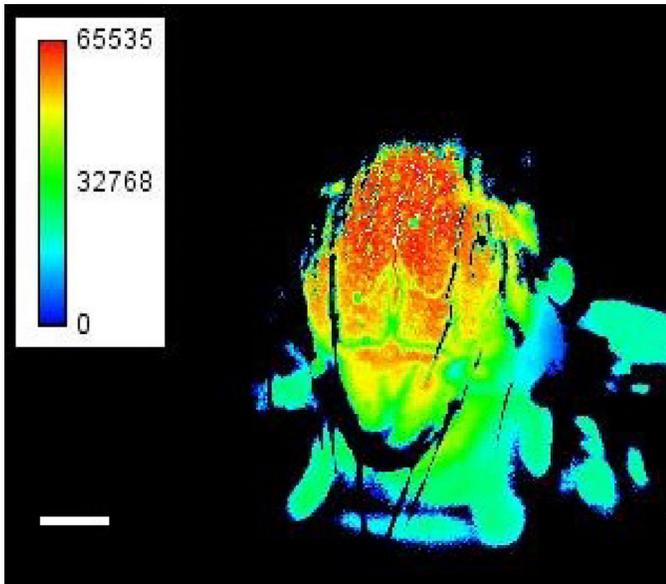
Have you had any significant mentors who have helped you beyond supervision in the lab?

Yes, my PhD supervisors Professors García-Sancho and Alonso who have guided me in this PhD journey and encouraged me to be critical. Their advice and appreciation of my work has been an incredible help in the day-to-day life in the laboratory. The postdocs and the previous PhD students have also been like mentors. They taught me everything that they knew and helped me with the technical difficulties.

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?

From the very beginning, what motivated me were my Biology and Chemistry high school teachers. They were excellent speakers, who were able to engage the class with creative lessons. They made me realize that I wanted to know more about the molecular mechanisms implicated in every physiological process.

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Fluorescent image of thorax muscles in a transgenic fly expressing the GAP3 Ca^{2+} indicator targeted to the sarcoplasmic reticulum. The image represents the GAP3 ratio calculated pixel by pixel from the individual GAP wavelengths (F470 and F405), an index of the stored resting $[\text{Ca}^{2+}]_{\text{SR}}$. The inset image is a pseudo colour scale where warm and cold colours indicate high and low $[\text{Ca}^{2+}]$, respectively.

Laura Contreras, the postdoc in Professor Satrústegui's lab helped me with my research project during my last year at the University and encouraged me to do a PhD to fulfil my innate curiosity in science. Now that I am finishing this period, I can say that

everything that I have learned during the past four years has been an eye opening and I have to admit that they have not only made me a better scientist but also a better person.

Who are your role models in science?

Everyone who is passionate enough about their science, and can balance it with a happy family life. If they can also find time to dedicate to their hobbies and socialize, then they are a hero.

What's next for you?

During my PhD I had the opportunity to do a short internship in Dr Perocchi's lab in Germany, working on a related project, using a high-throughput approach. We were lucky enough to obtain promising results, and I have the great opportunity of continuing this project as a postdoc.

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

I like to sing (even while doing experiments). My mother used to sing in a band and I inherited that talent. I studied music as a kid; more precisely I learned to play the piano for 5 years and I take advantage of every situation to sing, this could be at family reunions or in karaoke scenarios. I even had the opportunity to sing during a conference dinner in a workshop organized by the European Calcium Society – there are pictures on their Facebook page that confirm this!

Reference

Delrio-Lorenzo, A., Rojo-Ruiz, J., Alonso, M. T. and García-Sancho, J. (2018). Sarcoplasmic reticulum Ca^{2+} decreases with age and correlates with the decline in muscle function in *Drosophila*. *J. Cell Sci.* **133**, 240879. doi:10.1242/jcs.240879