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FIRST PERSON

First person – Claudio Bussi

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. Claudio Bussi is the first author on 'Alpha-synuclein fibrils recruit TBK1 and OPTN to lysosomal damage sites and induce autophagy in microglial cells', published in Journal of Cell Science. Claudio conducted the research in this article while a PhD student at the Center for Research in Clinical Biochemistry and Immunology (CIBICI-CONICET), Cordoba, Argentina, under the supervision of Dr Pablo Iribarren. He is now a postdoc in the lab of Dr Maximiliano Gutierrez at the Francis Crick Institute, London, UK, investigating human macrophage cell biology dynamics during *M. tuberculosis* infection.

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

Autophagy is a mechanism whereby cells recycle or eliminate dysfunctional components that do not work, or are not needed. In general, it is a protective response and it allows the cells to continue with their lifespan. Autophagy can be activated when the cells stop sensing that there are enough nutrients (starvation), but also in different stressful conditions including the response to infection or during disease. In this article, we studied the process of autophagy in microglial cells that take up a protein named alpha-synuclein (AS). Microglial cells are considered as 'the guardians of the brain' that try to protect us when they detect damage or something that is not functioning well. AS is a protein that forms toxic aggregates in neurons of patients suffering from Parkinson's disease, a neurodegenerative disorder. We found that AS induces autophagy in microglial cells and this response was necessary to extend microglial cell survival. We hope that future studies analysing the interaction between AS, microglial cells and autophagy will contribute to the design of novel therapies for neurodegenerative diseases.

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

We had worked with alpha-synuclein and microglial cells before and this helped us to continue with the new project. Although working with different conformations of alpha-synuclein is challenging, we had the advantage of collaborating with Dr Celej's group. They are biophysicists with expertise in protein folding and amyloid aggregates and helped us with several technical aspects, such as protein synthesis, purification and characterization. On the other hand, there wasn't much evidence of autophagy dynamics in microglial cells. Thus, we had no previous reports or results to compare or use as a reference. However, I do consider this to have become the main incentive for this work.

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Claudio Bussi

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

"This … aroused my curiosity enough to continue with more cell dynamics experiments."

Although we already had some data from fixed time points, one important moment was when we saw the live-cell imaging movies showing the autophagosome marker LC3 clearly surrounding AS fibrils in a ring-like pattern. This evidenced a role for autophagy in response to these protein aggregates and aroused my curiosity enough to continue with more cell dynamics experiments. Then, it was great to correlate these events with the cellular ultrastructure by CLEM experiments.

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

Journal of Cell Science has always been a leading journal in cell biology and I really enjoy its structure and format. I also like the fact that is published by a not-for-profit charitable organisation and the extensive support offered to the cell biology community through the Travelling Fellowship and Meeting Grants Programme. In fact,

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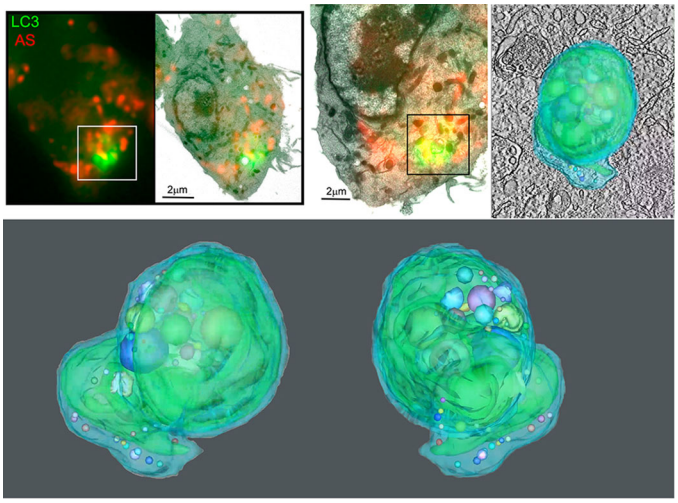

Representative images from a live-cell CLEM experiment performed with BV2 GFP–LC3 (green) microglial cells stimulated with AS fibrils (red) for 12 h. Of note, the LC3-positive area correlates with an autophagosome, which is reconstructed in 3D.

I also received a Travelling Fellowship from Journal of Cell Science, which was a great support for one of my short-research stays abroad.

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

Since I began my first research training I have been surrounded by supportive mentors and a great environment, which makes it hard to only mention some of them. Of course, I particularly thank all the members of the lab and institute where I did my PhD (CIBICI-CONICET, Argentina). In addition, I am very thankful to Dr Ktistakis' lab (Babraham Institute, Cambridge, UK) and to Dr Schwab and the Electron Microscopy Core Facility team at EMBL-Heidelberg (Germany) for all the support received during this project.

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?

At my home university (National University of Cordoba, Argentina) teaching and research activities are closely associated. This allowed me to get involved with research and become a member of a lab very early. For sure, the cell biology and immunology classes were an important influence and motivated me to continue a research career.

One remarkable experience during my PhD training was my short stay at the Ktistakis lab. I really enjoyed the in-depth discussions and how constructive criticisms strengthened my project. Certainly, it was a significant moment that reinforced my choice for an academic career.

Who are your role models in science? Why?

"I also believe that a scientist, as a member of a community, must be committed to society…"

Since I started my bachelor's degree, I have been in touch with researchers coming from different areas of expertise and career pathways. I am not able to select only one of them as my role model, but I am sure I have learnt from all of them. I identify myself with the scientist willing to challenge what is commonly accepted and who tries to answer an innovative question by offering several lines of evidence, instead of prioritizing multiple claims that are met in limited scenarios. I also believe that a scientist, as a member of a community, must be committed to society and participate in activities for this purpose.

What's next for you?

I am committed to continuing with an academic career. I understand that it is not a simple path and that it presents several difficulties. However, I know that this is what I like and I hope I can achieve it.

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

I love travelling and the sea is my favourite place. I am a basketball and tennis fan although I am not very active at the moment… I do enjoy reading philosophy, listening to music and I am a cinephile. I love coffee. I really like to have long talks with friends (especially if that happens in a pub).

Reference

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