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FIRST PERSON

First person – Diana Papini

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. Diana Papini is first author on 'Cell cycle-independent furrowing triggered by phosphomimetic mutations of the INCENP STD motif requires Plk1', published in JCS. Diana conducted the research described in this article while a Darwin Trust PhD student in Prof. William C. Earnshaw's lab at Wellcome Centre for Cell Biology at the University of Edinburgh, UK. She is now a Research Associate in the lab of Prof. Jonathan Higgins at the Newcastle University Biosciences Institute (NUBI), Newcastle upon Tyne, UK, investigating how cells rescue late segregating chromosomes (so called 'laggers') in anaphase to prevent aneuploidy.

Diana Papini

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

To sustain life, cells must be able to divide into two genetically identical daughter cells. During cell division (mitosis), faithful sharing of copied chromosomes between new cells is fundamental to maintaining genetic stability. Cells are equipped with mechanisms that coordinate and ensure the timing and the accuracy of this process, but errors can still occur. These errors can lead to cells with the wrong numbers of chromosomes and to birth defects, miscarriage or cancer. One of the most studied complexes in mitosis is the chromosomal passenger complex (CPC). The CPC is a major regulator of mitosis and it is required for chromosome separation and the completion of cell division or cytokinesis. Inner centromere protein (INCENP), the main protein studied in this article, is the scaffold of the CPC and controls the activity of the CPC, which is based on Aurora B kinase. In this article, we have identified a new region of the CPC (INCENP STD motif) and showed that it is highly modified in cells. If this modification is blocked, chromosomes can no longer separate correctly and cell division fails. Interestingly, a permanent modification of the region restores chromosome separation and cell division but additionally triggers cells to mimic cell division outside of normal mitosis.

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

Journal of Cell Science is a very well-renowned and respected journal in the field of cell biology, and for decades its impact in the scientific community has been well recognised. JCS always publishes a broad selection of cell biology topics, and we believed it was the perfect fit for us to simultaneously reach both a specialized (mitotic field) and a wide-ranging audience of cell biologists.

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

Since the first time I walked into a laboratory as an undergraduate, I have been extremely lucky to have numerous mentors that have guided me during the years. I was fortunate to begin my research path under the supervision of Dr Daniela Talarico at University Vita-Salute San Raffaele in Milan, and her excellent training has had a significant impact on my scientific development. I learned from the outset the importance of being organized in designing experiments meticulously, and this is the first thing I teach to the students I supervise in the lab. Prof. Bill Earnshaw was my PhD supervisor, and the years spent in his lab were the most influential of my career. I had a lot of freedom in leading my research project, and this was essential to becoming independent in my work by finding my own way to address research questions or sorting problems, if any, but at the same time I learned to ask for help when needed. He taught me to be critical towards my data, and above all to be strong and to be confident in front of a challenging audience. As part of his training, I also had the opportunity to form very productive collaborations inside and outside the lab, one example being with Dr Ruchaud that has led us to publish this interesting story in JCS, and also with other international laboratories that have been fundamental for my PhD. Such collaborations are vital for a successful scientific career! For the past few years I have been working in Prof. Jonathan Higgins' laboratory on my current project, investigating the rescue of lagging chromosomes in anaphase. During this time, he has provided me with advice and help in my project and also on my career by helping me to develop my skills in project proposal writing for grant or fellowship applications.

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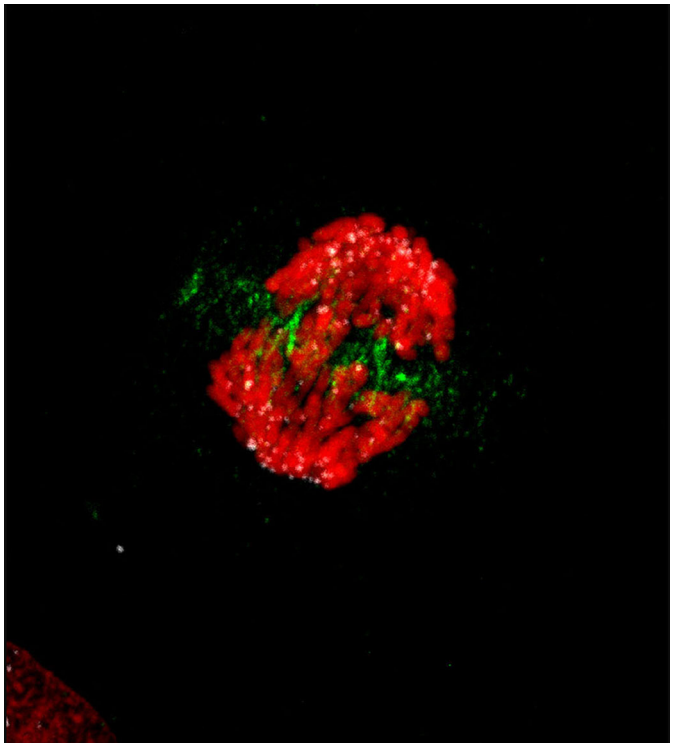

Anaphase lagging cell imaged by confocal microscopy. Lagging chromosome formation was induced by MPS1 (monopolar spindle 1) kinase inhibition. HeLa Kyoto cells were fixed and immunostained for DNA (in red), the mitotic kinase Aurora B localized at the midzone (in green) and centromeres (in gray).

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?

In my family, almost everyone had a degree in economics or statistics, and although my father wished for me to have a career in finance, I was stubborn and instead chose to study a science degree. Initially I wanted to study medicine and be a doctor, but unfortunately (or fortunately, I would say today!) I wasn't selected in my first year and I decided to go for molecular biology instead with the hope to get into med school the following year. Having soon understood that I was very interested and engaged in biology, I realized that medicine was no longer the career I wanted to pursue. Ever since I was a student, I have always been very curious, I was always interested in the work of my colleagues, and would try to learn from them. However, the deciding moment came when I went to Prof. Bill Earnshaw's lab in Edinburgh for a summer studentship. This was supposed to last only 3–4 months, but I actually never returned to Italy, and have now been in the UK for 11 years. It was when I went to the microscope with my own samples for the first time (a simple immunofluorescence assay of fixed HeLa cells), I found it amazing to look at the stunning architecture of chromosomes and microtubules, and this was the moment that triggered my fascination with cell division. As a result, I applied for and was awarded a PhD studentship (Darwin Trust of Edinburgh) in Bill's lab. That day definitely had a huge impact on my research path and led me where I am today.

"I learned from the outset the importance of being organized in designing experiments meticulously…"

What's next for you?

I have started my sixth and final year of my post-doctoral studies in the Higgins lab, and I am now at that stage of my career where I should consider what the next step is for me in academia and start planning a strategy to move toward independence. At the moment, I am working on two further manuscripts that I aim to complete soon and submit for publication in the near future. As soon as this goal is achieved, I intend to start applying for early-career fellowships and start the path toward research independence.

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

I am a musician; I have been playing the flute since I was 10 years old. I was studying flute at the International Music Academy of Milan while I was also studying molecular biology at the University of Milano-Bicocca. Unfortunately, by the end of my bachelor's degree, I had to quit the music academy because I wasn't able to carry on with both with equal dedication, but I have never stopped playing. In fact, I played in the Edinburgh Ensemble Orchestra during my PhD, and it was the perfect way to relax and free my mind from the usual stresses and strains of studying for a PhD!

Reference

Papini, D., Fant, X., Ogawa, H., Desban, N., Samejima, K., Feizbakhsh, O., Askin, B., Ly, T., Earnshaw, W. C. and Ruchaud, S. (2019). Cell cycle-independent furrowing triggered by phosphomimetic mutations of the INCENP STD motif requires Plk1. *J. Cell Sci.* **132**, 234401. doi:10.1242/jcs.234401