

FIRST PERSON

First person – Agnieszka Pierzynska-Mach

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping researchers promote themselves alongside their papers. Agnieszka Pierzynska-Mach is first author on 'DEK oncoprotein participates in heterochromatin replication via SUMO-dependent nuclear bodies', published in JCS. Agnieszka conducted the research described in this article while a researcher in Alberto Diaspro's lab at the Nanoscopy & NIC@IIT, Istituto Italiano di Tecnologia, Genoa, Italy. She is experienced in cell biophysics and specializes in investigating chromatin structure and DNA-related cellular processes with high-resolution microscopy techniques.

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

Understanding how genetic information is passed down accurately from cell to cell is crucial for understanding how cells stay healthy and for preventing diseases such as cancer. Our article focuses on a protein called DEK, which is known to promote cancer progression. We discovered unique DEK nuclear bodies that form during a specific, late stage of DNA replication. These DEK bodies, located in regions of compacted chromatin, are important for the maturation of particular regions of heterochromatin DNA. Through our study, we found that the formation of DEK bodies is influenced by a network of proteins, involving a key player called SUMO, which controls how our DNA is structured and how cells behave. This research sheds light on the role of DEK in maintaining DNA integrity and opens new paths for exploring its involvement in cancer development.

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

In the course of this study, our exploration was marked by numerous enlightening moments. Following our initial observations of DEK bodies, we formulated hypotheses about their behavior and function. Conducting the planned experiments and systematically compiling the results felt like assembling a puzzle, which ultimately led us to solid conclusions. It was a truly inspiring period.

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

We wanted our discovery of DEK bodies to reach a broad audience in the fields of cell biology and microscopy research. We believe that sharing our work with the readers of JCS will enhance the visibility and impact of our findings.

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

I have been very fortunate to work alongside exceptional mentors who have each played a unique role in shaping my skills and perspective. Dr Francesca Cella Zanacchi (University of Pisa, Italy), introduced me to advanced fluorescence microscopy and super-resolution techniques, elevating my understanding of cell biology.

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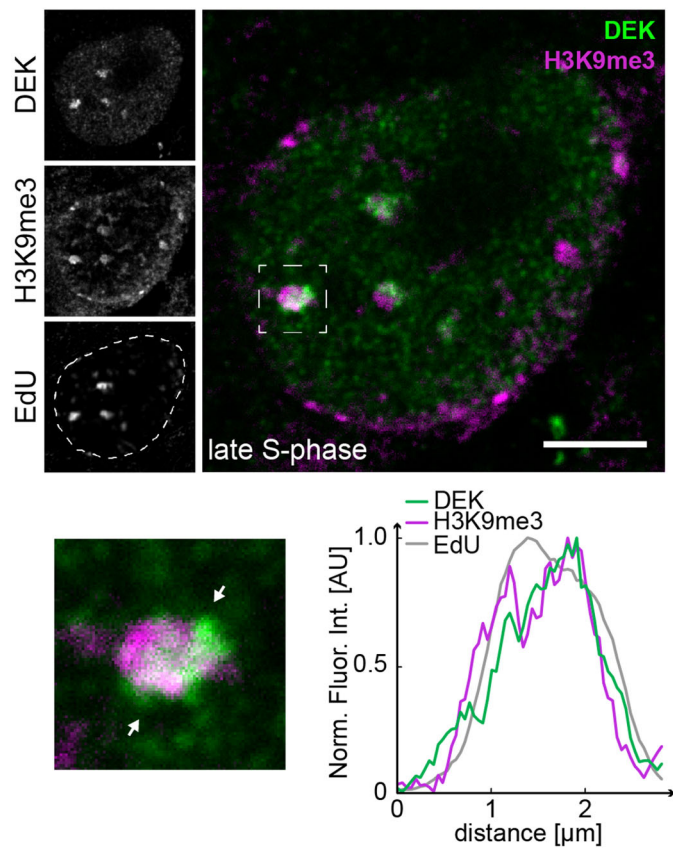


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Thanks to our collaboration with Prof. Luca Lanzaò (University of Catania, Italy), I delved into novel image analysis tools like image cross-correlation spectroscopy, enhancing my proficiency in quantitative analysis. Dr Giuseppe Vicidomini (Molecular Microscopy and Spectroscopy, Italian Institute of Technology, Italy) not only welcomed me into his projects but also fostered a collaborative and supportive research atmosphere, allowing me to contribute a biology-focused viewpoint. Collaborating with Prof. Ferdinand Kappes (Duke Kunshan University, China) and Prof. Elisa Ferrando-May (German Cancer Research Center and University of Konstanz, Germany) on our project about the formation of DEK bodies was a significant research milestone for me which provided rich insights and experiences. However, above all, Prof. Alberto Diaspro [Nanoscopy & Nikon Imaging Center (NIC@IIT), Italian Institute of Technology, Italy] has been a consistent guiding force through my postdoctoral experience. His mentorship, coupled with his support on my Marie Skłodowska-Curie Actions funded project, has been instrumental in my growth as a researcher. Together, these mentors have collectively influenced my scientific development and enriched my research endeavours.

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?

My motivation to pursue a career in science is a combination of my need to seek out intellectual stimulation, my problem-solving drive



DEK protein bodies formed at the late S-phase DNA replication sites of heterochromatin in MCF10A cells, visualized by co-immunofluorescence staining of DEK and H3K9me3 and EdU labelling. The inset and fluorescence intensity line profile show a colocalizing distribution pattern of DEK and H3K9me3 in late S-phase replication sites. Scale bar: 5 μm .

and my desire for self-development. The most exciting moment on my scientific path happened after I decided to move to Italy for a postdoctoral position. I succeeded in obtaining Horizon Europe MSCA funding for an Individual Fellowship, and joined a new scientific environment. Soon I realized that working within a

multidisciplinary and international group was very beneficial for me, and I managed to establish multiple collaborations within the institute and with international project partners, which resulted in the work presented in this article.

Who are your role models in science? Why?

In my scientific journey, I've had the privilege of collaborating with and learning from exceptional scientists who have embodied qualities that I find truly inspiring. While I don't have specific individuals as role models, I deeply value certain behaviors and features that I've observed in these esteemed colleagues. Firstly, effective leadership is a trait that has left a lasting impression on me. Witnessing how certain scientists adeptly lead and manage their research groups has been truly influential. Their ability to inspire and respectfully guide their team's members has been a source of motivation for my own professional development. Moreover, I greatly appreciate scientists who can see the bigger picture in their research. Personally, I tend to focus on the intricacies of my specific research areas and sometimes get lost in the details. Using holistic approaches to understand not just a particular research problem but also the importance of the advancement of a research project is a feature which I value greatly in more experienced scientists. The mixture of leadership, vision and effective collaboration exhibited by exceptional scientists I've encountered serves as a collective source of inspiration for my professional journey.

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

I have a background in music, and I attended a conservatory for 12 years of my education. Although I played piano, which still I enjoy, my main musical passion is singing in a choir. While staying in Italy, I was a part of a great local choir that sings sacred and opera music. I had the opportunity to perform concerts in amazing Italian locations such as picturesque towns in the middle of vineyards, (sometimes very cold) medieval churches and colorful plazas at sunset. These moments of sharing music with other choir members and our audience will stay with me for long time.

Reference

Pierzynska-Mach, A., Czada, C., Vogel, C., Gwosch, E., Osswald, X., Bartoschek, D., Diaspro, A., Kappes, F. and Ferrando-May, E. (2023). DEK oncoprotein participates in heterochromatin replication via SUMO-dependent nuclear bodies. *J. Cell Sci.* **136**, jcs261329. doi:10.1242/jcs.261329