

FIRST PERSON

First person – Libi Anandi

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. Libi Anandi is the first author on 'DNA-dependent protein kinase plays a central role in transformation of breast epithelial cells following alkylation damage', published in Journal of Cell Science. Libi is a PhD student in the laboratory of Mayurika Lahiri at Indian Institute of Science Education and Research, Pune, India, investigating the early events of cellular transformation.

How would you explain the main findings of your paper to non-scientific family and friends?

We are exposed to various chemicals through a wide variety of sources. One class of chemicals we encounter often is DNA-damaging agents. To protect themselves, cells have developed defence mechanisms that are carried out by a range of proteins. DNA-PK is one such protein, acting as the sensor of DNA damage. We have shown that DNA-PK, the guardian of our genome and widely known to help in repairing DNA damage, is also capable of eliciting a response that makes the cells abnormal. Such abnormal cells have most of the characteristics of cancerous cells.

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

Immunostaining, which is the most widely used technique in this work, posed a challenge when we were trying to tag apical and lateral proteins of the Golgi. We modified a widely used 3D immunostaining protocol by including an additional step of incubating the cells in PBS containing EDTA (PBS-EDTA). This modification aided in getting cleaner staining. However, this approach failed to work with phosphorylated ezrin, radixin and moesin, which marks the apical region. The phosphorylation was observed to be unstable and lost during incubation with PBS-EDTA. To overcome this, we further adapted the regular protocol by the addition of phosphatase inhibitors at both the fixation and permeabilisation steps, and modified the permeabilisation step.

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

Every small obstacle I have overcome during this work and every new observation I made has had the excitement of a 'eureka moment'. One of them was identification of the abnormal Golgi phenotype. The observation was serendipity; we were in the process of investigating the integrity of polarity and used equal proportions of Matrigel and collagen as the substrate. The Golgi morphology observed was astonishing and prompted us to re-analyse the Golgi morphology of cells in acini grown on Matrigel (the regular substrate). This was a turning point for the entire project. This



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observation, coupled with a thorough reading of literature, served as the clue to predict the mechanism.

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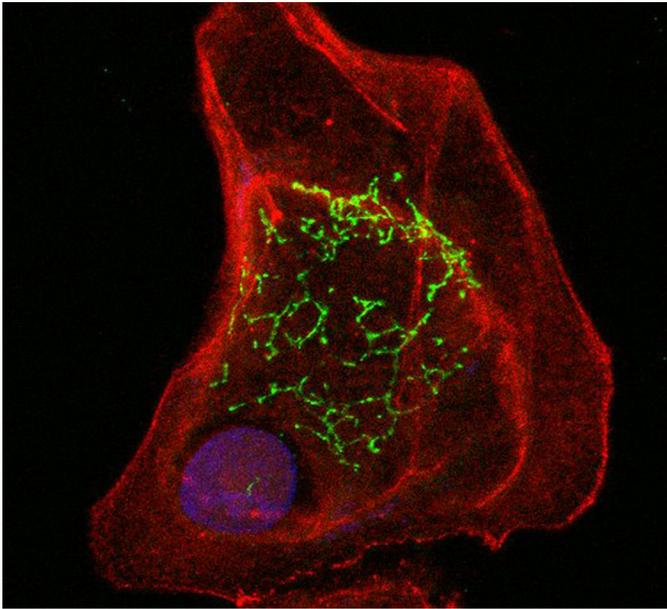
Have you had any significant mentors, and how have they helped you?

My thesis advisor, Dr Mayurika Lahiri, has been a significant mentor throughout my PhD and still continues to be one. She has inculcated critical thinking and a positive approach towards research in me. My research advisory committee has been very instrumental in transforming and shaping the work into its current form. Their constructive criticism at every stage of my work has been very useful. They taught me to be more observant and this piece of advice probably laid the foundation for the turning point.

What's the most important piece of advice you would give first-year PhD students?

A PhD is a long scientific journey and, to successfully reach your destination, you need the fuel of a passion for research. This fuel, coupled with patience and persistence, strengthens you to solve the

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Reconstructed 3D image of aberrant Golgi morphology (green) in MCF10A cells following DNA damage by an alkylating agent, with actin in red and nuclei in blue.

problems you will face. A thorough literature review at the start of your PhD, as well as having a rough self-written proposal, will serve as the guiding light. Science is so fascinating and every question we answer will raise multiple new questions, so having a clear proposal helps you to focus.

“A PhD is a long scientific journey and to successfully reach your destination you need the fuel of a passion for research”

What changes do you think could improve the professional lives of early-career scientists?

Adequate funding is always a major concern for early-career scientists. Providing sufficient funds for both research and to attend conferences would greatly improve their professional lives. Discussion with experts in the field at conferences not only helps early-career scientists to achieve their goals within the time frame provided, but also improves the quality of their research and reforms the outcomes.

What’s next for you?

I will be joining Dr Carlos Carmona-Fontaine’s lab at New York University as a postdoctoral research associate, where I will be studying the effect of metabolic features of the microenvironment on the process of tumorigenesis.

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

Art and craft are my stress busters. When I’m not doing research, you will find me amidst a pile of coloured papers, newspaper and cardboard pieces.

Reference

Anandi, L., Chakravarty, V., Ashiq, K. A., Bodakuntla, S. and Lahiri, M. (2017). DNA-dependent protein kinase plays a central role in transformation of breast epithelial cells following alkylation damage. *J. Cell Sci.* **130**, 3749-3763.