

FIRST PERSON

First person – Rachel O’Dea

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. Rachel O’Dea is first author on ‘Non-canonical regulation of homologous recombination DNA repair by the USP9X deubiquitylase’, published in JCS. Rachel is a PhD student in the lab of Prof. Corrado Santocanale at Centre for Chromosome Biology, NUI Galway, Ireland investigating the mechanisms by which the ubiquitin system regulates cellular processes.

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

Living organisms are composed of microscopic subunits known as cells. These cells work together to allow the organism to function. The instructions for these cells are found inside them, encoded in a material called DNA. As cells grow and multiply, this DNA can be damaged. To prevent this damage from causing disease or even death, cells have evolved multiple repair pathways. These pathways use a variety of different cellular components known as proteins. In this paper we describe the identification of a new protein required for one of these pathways. We demonstrate that this protein, USP9X, is required for efficient execution of this repair pathway and that in the absence of this protein, cells accumulate DNA damage.

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

In addition to the typical challenges that come with every project, we encountered a major technical challenge; reproducibly detecting BRCA1 by immunoblotting. After some optimization we found that running overnight protein transfers was the solution, but this risked overheating the membrane. To allow us to run these transfers without purchasing new equipment, I developed a new high-tech transfer system...a bubble wrap-insulated Styrofoam box.

“...I developed a new high-tech transfer system...a bubble wrap-insulated Styrofoam box.”

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

The most ‘eureka’ moment that I experienced was when the exogenous expression of USP9X rescued our knockdown phenotype. This was a crucial control experiment and getting the expression level right had posed significant technical challenges that made this a memorable moment.

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

We chose to publish our paper in the Journal of Cell Science as this journal has a strong reputation for publishing articles of high scientific excellence.



Rachel O’Dea

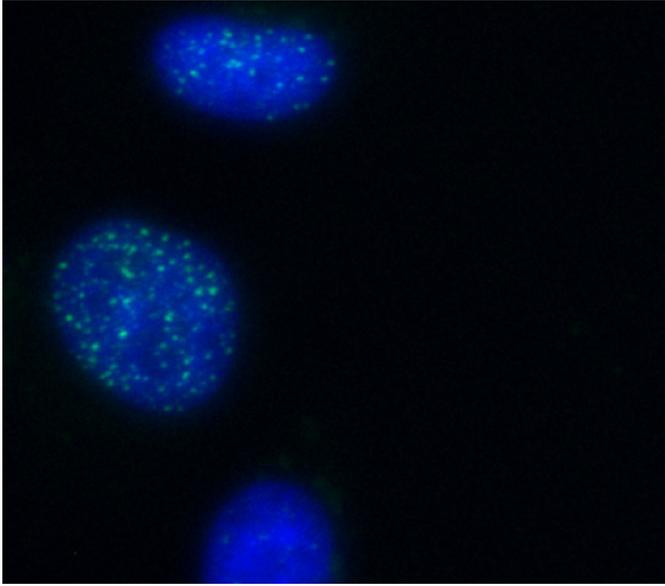
Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

I have been very lucky with the people I have encountered in science so far. The supervisor of my first research project, Dr Andrew Flaus, was very supportive during my bachelor’s degree and remarkably still leaves his door open for me to bother him for career advice. My PhD supervisor, Prof. Corrado Santocanale, has been a major mentor of mine over the past 5 years – his mentoring was special as he gave me excellent training on how to think like a scientist and some life lessons that will stay with me. Finally, Dr Michael Rainey, a senior post doc in the Santocanale lab, has given me immeasurable guidance both in the lab and in life in general.

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?

There were two teachers during my education who were key to me pursuing a career in science. The first was my secondary school biology teacher, Ms Maura Conneally, who taught science in a highly organized, simplified and logical manner. This method of teaching appealed to me and allowed me to discover my love for this area. During my bachelor’s degree I took part in an exchange programme at John Carroll University, Ohio; there I had the opportunity to be

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Immunofluorescence staining of γ -H2AX, a marker for DNA double strand breaks in cells depleted of USP9X. γ -H2AX is stained green and the cell nuclei are stained with DAPI (blue).

taught biochemistry by Dr Yuh-Cherng Chai, his teaching made me realize that everything is understandable, at least in principle.

An interesting moment for me, which led to my decision to pursue a career in molecular biology, was reading 'The Inner Life of the Genome', an article by Dr Tom Misteli in *Scientific American*. I read this article, which discusses advances in understanding how our genomes are organized, as part of an assignment in the first year of my bachelor's degree. It was my first exposure to techniques used in molecular biology. I was fascinated by what had been achieved and hoped to be able to perform similar experiments.

What's next for you?

I am moving to Germany to start a post doctoral position researching the mechanisms that regulate the activity of deubiquitinases.

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

I once organized a barbecue in a nightclub for over 200 people at our institute.

Reference

O'Dea, R. and Santocanale, C. (2020). Non-canonical regulation of homologous recombination DNA repair by the USP9X deubiquitylase. *J. Cell Sci.* **133**, 233437. doi:10.1242/jcs.233437