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FIRST PERSON

First person – Sarah Taheraly

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. Sarah Taheraly is first author on 'An image analysis method to survey the dynamics of polar protein abundance in the regulation of tip growth', published in JCS. Sarah conducted the research described in this article while an Engineer in Biology and Health in the lab of Nicolas Minc, at the Institut Jacques Monod, Paris, France. She now works in the lab of Philippe Benaroch at the Institut Curie, Paris, as an motivated engineer interested in cell biology, immunology, genetics and astronomy.

Sarah Taheraly

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

In nature, cell growth rates may vary over two to three orders of magnitude between species. What could limit cell growth is a key problem in understanding the life of a cell. Walled cells, including those of bacteria, fungi and plants, serve as prominent models to study cellular growth because of their rapid growth and smoothness in deformation, which are easier to track back. With my colleague Dmitry Ershov, we developed a useful semi-automated method to measure the polar abundance of factors during tip growth in a large set of data by investigating several key components of polarity, cytoskeleton dynamic and cell wall remodeling. Our findings suggest that, in the fission yeast model, a majority of these factors are diluted but yet positively correlated with growth. This saturation of growth material is also seen in fast-growing fungal hyphae, indicating that factors independent of the abundance of canonical proteins may limit the growth of the single tip. Note that this work provides to the community a tool to allow for a more quantitative data analysis.

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

The development of a tool is always a challenge, especially when you have to follow up on previously initiated work. Both developer and user have to work as a team for the user to benefit from the developer's work. Sometimes, when a user does not find an answer to fix a problem, he has no choice but to go back to the core of the problem in order to overcome it. In the developing process of our semi-automated Pombenator 2.6 tool, I not only was able to understand the basics of the programming but I also contributed to adapting the tool to make it more user-friendly for extracting the results that helped to dissect the key phenomena linked to cell growth. As this was my first experience writing a paper and making figures, I will no longer see the figures of a paper in the same way; as I know there can be hours of work behind a single figure.

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

Life comes with many shades and challenges, especially in our field, from understanding a unicellular fission yeast cell, a growing *Drosophila* embryo, to lymphocytes colonizing a tissue. I am grateful that because of my work, I was able to navigate through these models. I'd like to keep the memory of each of the studies I worked on as little wonders and assemble them into a puzzle forming a big 'eureka'.

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

Journal of Cell Science has been a key journal in the cell biology field. As it is my first ever paper, JCS will always be close to my heart. During my schools days, not so many years ago, I remember presenting quality papers from the journal. Back then, I would not have imagined that I would have myself the opportunity to contribute to the field through JCS. So I am very grateful to the JCS editorial team, and I have no doubt that we will benefit from its wide audience to share our work, which will help the community.

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

This work was achieved with the total support of Nicolas Minc (PhD Research Director at the Jacques Monod Institute – IJM – in Paris, France). He saw my potential and trusted me to lead this project. I surpassed myself and worked hard to live up to the expectations of the high quality of studies conducted at the Minc lab, many of them published in JCS. Véronique Brodu's (PhD, researcher at the IJM) kind advice has contributed a lot to this achievement; I learned so many things about science because of her. Not only that, her humanity, kindness and strength showed me the best way to conduct myself in this challenging field and eventually become someone to be remembered.

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 parents motivated me to pursue a career in science. Even though they are completely outside of the field, the challenges they had from

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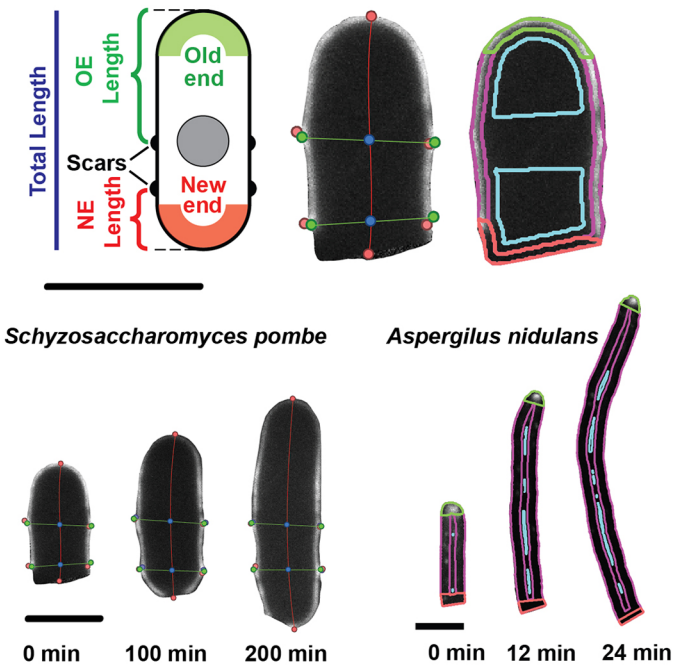

Image analysis method to investigate polar protein abundance during tip growth in various models from yeast to fast growing fungi. Scale bars: 5 µm.

building a professional life made me realize how lucky I was to be in this field. Their faith in me was essential. We take parents for granted, but whatever I have achieved today is because of and for them.

Who are your role models in science? Why?

Science is a constantly moving field. One belief can easily be questioned by another, which is why having a model is tricky. A scientist I look up to is Marie Skłodowska-Curie. She is one example of a fierce woman who fought for what she believed was right and ended up giving her life as a result of her discovery of radioactivity. Through the quality of her work, she raised her voice against people pointing at her gender, her origin and her name. One cannot simply forget two other women who have immensely contributed to the fundamental biology field, the Nobel Prize-awarded Emmanuelle Charpentier and Jennifer Doudna, who have provided solid examples that a study started in plants can lead to one of the most crucial findings of our time. Even if one lived a century ago and the two others are my contemporaries, their legacy still rules in the work of many scientists, now more than ever.

What's next for you?

Since I took Marie Skłodowska-Curie, for example, she once said "A scientist in his laboratory is not a mere technician: he is also a child confronting natural phenomena that impress him as though they were fairy tales." I am currently working as an engineer at The Curie Institute in Paris (France), trying to dissect the complexity of immune cell signaling. I want to keep working on as an engineer and being confronted by those natural phenomena and share great stories that would benefit my fellow colleagues from all across the world.

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

Old scientific papers have figures that were more like drawings. Like those pioneer scientists, I enjoy drawing, painting and watching documentaries about nature and science. I also have a keen interest in learning languages as I can read and speak seven languages, including French, English, Japanese and Arabic. Maybe that aspect of my personality made me curious about the complexity of the world we live in.

What is your advice for students who want to pursue a career in a science field?

Science is a beautiful field, which comes with challenges. One should remember that today's challenges will become tomorrow's achievements. In the crowd of opinions, speak for yourself and listen to your inner voice in moments of joy and doubts. Today, this field still needs bright young scientists and, more than ever, it needs people to put trust in them. I was lucky enough to come across eminent scientists who trusted me. For team leaders, please don't hesitate to work with 'newcomers' that have just obtained their degree. Give them their chance by internships, for example. Especially during this global pandemic, let's continue to work together!

Reference

Taheraly, S., Ershov, D., Dmitrieff, S. and Minc, N. (2020). An image analysis method to survey the dynamics of polar protein abundance in the regulation of tip growth. *J. Cell Sci.* **133**, jcs252064. doi:10.1242/jcs.252064