

FIRST PERSON

First person – Viktoria Betaneli

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. Viktoria Betaneli is first author on 'Mechanism of control of F-actin cortex architecture by SWAP-70', published in JCS. Viktoria is a Postdoc in the lab of Prof. Rolf Jessberger at Medical Institute Carl Gustav Carus, Institute of Physiological Chemistry, Technische Universität Dresden, Germany, investigating protein oligomerization and the actin cytoskeleton with fluorescence resonance energy transfer (FRET), fluorescence lifetime imaging microscopy (FLIM) and fluorescence correlation spectroscopy (FCS).

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

Actin is a protein that plays an important role in regulating the shape of cells and the way they move. Monomeric actin can be arranged into filamentous structures called F-actin. F-actin can be further crosslinked by actin bundling proteins in order to be arranged in superstructures called actin bundles. One of the actin-bundling proteins is known as SWAP-70. However, the way SWAP-70 regulates actin bundling in the living cell is not fully understood. In this work, we have revealed a SWAP-70-dependent mechanism of actin bundling. SWAP-70 needs to translocate from the cell cytoplasm to the membrane, where it forms dimers that bind and bundle actin filaments. In addition, SWAP-70 dimerization and binding to actin is regulated by its phosphorylation.

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

The main challenge of the study was to learn and implement different FRET techniques like sensitized emission FRET, FACS-FRET and FLIM-FRET to study protein oligomerization at the cell membrane and binding to F-actin. This was also my first research project that was performed on living cells. It was extremely fascinating and interesting and I think this will allow scientists to overcome difficulties.

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

Initially, I failed to find SWAP-70 dimers in the cytoplasm of the cell using FCS and FRET techniques. Then I had the idea that the protein needs to be phosphorylated or bound to the membrane in order to dimerize, which appeared to be true. It was very fascinating that my hypothesis was proven by the experiment.

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

The Journal of Cell Science has publications that are of interest for an audience within broad interdisciplinary research fields. These publications usually provide the mechanisms of molecular interactions in cells supported by studies using advanced microscopy techniques. I have read and appreciated the publications



Viktoria Betaneli

from this journal very often and I thought that my research would fit to the scope of the journal.

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

I would like to thank my supervisor Prof. Jessberger. He gives me freedom, and always supports me with meaningful advice. The most important thing about him is his love for science, which is transmitted to other people motivating them to move forward regardless of possible failures.

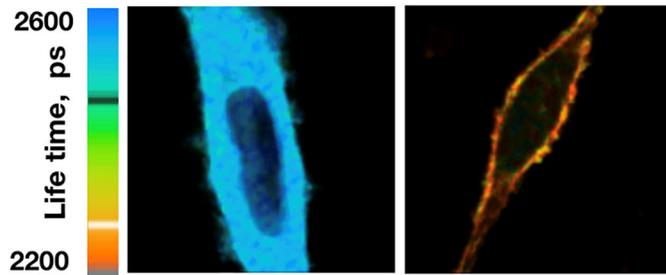
What motivated you to pursue a career in science, and what have been the most interesting moments on the path that led you to where you are now?

I was always very curious to understand things. I have a wide imagination and like to solve logical problems. I started my career in physics, then moved to the biophysics field during my PhD and now I am exploring biology. In the beginning, I was a bit scared to learn new things and enter into unknown fields, but now I am used to it and find it extremely fascinating and interesting. I also have to thank my father, who supported me throughout my life to accomplish education and who made me believe in myself and gave me confidence to move to another country with a little child to pursue my PhD.

Who are your role models in science? Why?

My role models in science are all researchers who do not give up and follow their dreams.

Viktoria Betaneli's contact details: Medical Institute Carl Gustav Carus, Institute of Physiological Chemistry, Technische Universität Dresden, Fiedlerstr.42, 01307 Dresden, Germany.
E-mail: viktoria.betaneli1@mailbox.tu-dresden.de



FSWAP-70 dimerizes upon binding to the cell membrane FLIM-FRET image of the cells cotransfected with SWAP-70–Cerulean and SWAP-70–Venus. Mean Cerulean fluorescence lifetime (ps) in the cell is presented in colour code according to the scale on the left. The lifetime at the membrane decreases suggesting SWAP-70 dimerization.

What's next for you?

I am planning to leave academia, but I will still do research. Recently, I started a project in applied medical science, and I find it very interesting and also encouraging as it can bring real outcomes for human health.

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

I like to dance!

Reference

Betaneli, V. and Jessberger, R. (2020). Mechanism of control of F-actin cortex architecture by SWAP-70. *J. Cell Sci.* **133**, 233064. doi:10.1242/jcs.233064