

## FIRST PERSON

# First person – Hendrik Schürmann

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. Hendrik Schürmann is first author on 'Analysis of monocyte cell tractions in 2.5D reveals mesoscale mechanics of podosomes during substrate-indenting cell protrusion', published in JCS. Hendrik conducted the research described in this article while a medical doctoral student in Timo Betz's lab at Institute of Cell Biology, University of Münster, Germany. He is now a research associate/physician in the lab of Jens Siveke at Bridge Institute of Experimental Tumor Therapy (BIT)/Department of Medical Oncology, University Hospital Essen, Germany, investigating using imaging-based screenings to predict treatment responses using preclinical cancer models.



Hendrik Schürmann

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

Immune cells typically travel through the body for surveillance and host defense. On their way, they are required to traverse physical barriers made of protein meshworks. Some cell types use small processes, so called 'podosomes', that can locally attach to and remodel the meshwork. Podosomes often appear in large groups and organize in interconnected clusters. Individually, they have been shown to act in a similar manner to little drills that locally push into the barriers they need to overcome. While these individual forces are important, we provide evidence that podosomes can form mechanical clusters that then act together through a different mechanism, leading to global pushing, compared to the local drill-like pushing.

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

We encountered various challenges, and I want to name just three. First, I was a beginner in programming, so to write my own programs that did what I wanted them to do was quite a challenge. But after I overcame the first hurdles, programming turned out to be quite central for my future work. Second, the project was originally based on the simple observation that the measured forces and deformations appeared 'strange'. As this was more of a feeling than a scientific statement, finding a proper approach was a challenge. Quantifying the 'strangeness', reading articles about podosomes, and talking to numerous people finally helped me to ask the right questions. Third and finally, I finished medical school right before the initial submission and moved to another lab to carry out a master's thesis while my supervisor moved to another university. These events made the revision process quite difficult. Fortunately, it worked out, also thanks to various online meetings with my supervisor and the co-authors.

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

There were several moments in which we found missing links for the final model. One such moment that was crucial for the project occurred when I was focusing on the lateral forces. I observed two force components but could not think of a relation to the broad indentation. However, it reminded me of endothelial cell layer mechanics that a colleague, Matthias Brandt, was working on and I talked to him about it. He rewrote parts of his internal stress quantification program and I tested it on my cells. The linear correlation between the internal stress and deformation fields was so striking that I double-checked that the deformation field was really not included in the stress calculation.

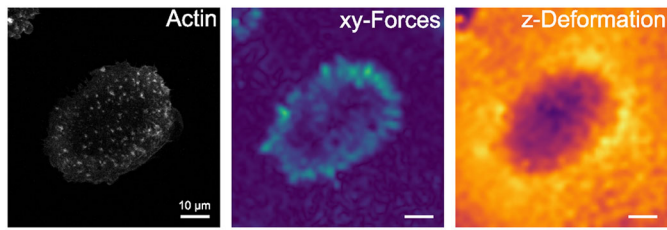
### Why did you choose Journal of Cell Science for your paper?

We wanted to reach the podosome community, but also scientists working in the broader field of mechanobiology or the cytoskeleton. During literature research, Journal of Cell Science was quite prominent, and thus piqued our interest, also because of its Open Access possibility and transparency. We definitely did not regret submitting to it. Communication after submission and during revision was excellent. Also, working on the reviewers' comments greatly improved the paper.

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

The person who mentored me over the past few years was my project supervisor, Timo Betz. He introduced me to science, always supported me beyond the project, and gave valuable advice on all sorts of issues. His style of guidance was special in so far as he often first let me do a 'trial and error' approach before getting me back on track when I was about to lose my way. Although stressful from time to time, it really helped me to think and act more independently. Currently, Jens Siveke guides me into translational (cancer) research and academia as a physician.

Hendrik Schürmann's contact details: Bridge Institute of Experimental Tumor Therapy (BIT)/Department of Medical Oncology, University Hospital Essen, Germany.  
E-mail: hendrik.schuermann@uk-essen.de



A podosome-forming monocyte (left) displaying cell-wide traction forces (center) and a broad substrate indentation (right).

**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?**

Primarily, I am a physician by training. Therefore, I am especially interested in the clinical application of scientific advances. However, I am also a very curious person, and as such I want to actively find answers to questions and contribute to science and solutions. When I was in my first year of medical school, a complementary study program to train medical students in biomedical research, ‘experimental medicine’, was first introduced. I did not hesitate to apply for it, and over the past years, I have spent as much time in the lab as in the hospital. Meeting several extremely enthusiastic and encouraging PIs, I got dragged deeper and deeper into the world of science. I do not want to be without it now, even though patient care will always be my top priority.

**Who are your role models in science? Why?**

For me, there are no classical role models. I do admire some scientists I have worked with though. These people are extremely enthusiastic and joyful about science. Their focus is on science and not on a ‘career in science’; in spite of, or maybe because of, that they are also very successful. They shaped their own path without adhering to any career template. Learning certain aspects from them and choosing my own path is how I can benefit.

**What’s next for you?**

In May 2022, I started working as a physician at the West German Cancer Center in Essen. As my department is very supportive, I am planning to continue with science after a short period of ‘acclimatization’. Also, I am shifting my focus to translational cancer research in the lab of Jens Siveke, where I also carried out the project for my master’s thesis.

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

I like spending time in nature. As a teenager I fished for hours and hours in the river, enjoying the silence. Today, I prefer hiking and getting around.

**Reference**

Schürmann, H., Abbasi, F., Russo, A., Hofemeier, A. D., Brandt, M., Roth, J., Vogl, T. and Betz, T. (2022). Analysis of monocyte cell tractions in 2.5D reveals mesoscale mechanics of podosomes during substrate-indenting cell protrusion. *J. Cell Sci.* **135**, jcs259042. doi:10.1242/jcs.259042