© 2020. Published by The Company of Biologists Ltd | Journal of Cell Science (2020) 133, jcs247338. doi:10.1242/jcs.247338

FIRST PERSON

First person – Christian Renz

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. Christian Renz is first author on 'Ubc13–Mms2 cooperates with a family of RING E3 proteins in membrane protein sorting', published in JCS. Christian is a postdoc in the lab of Helle Ulrich at IMB, Mainz, Germany investigating the biochemistry and cell biology of ubiquitin signaling.

Christian Renz

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

The Inca culture developed a knot-based code called quipu that allowed the Incas to keep records, collect data and communicate. A quipu consisted of a cotton fiber into which a series of knots was tied; the arrangement of these knots encoded the information. Cells have also developed several complex communication codes. One of them is mediated by a small protein, ubiquitin. Cellular enzymes write the ubiquitin code by joining several ubiquitin units into polymeric chains of distinct geometric arrangements, thus resembling the knots of a quipu and conveying distinct biological signals. In this manner, the ubiquitin code is involved in most, if not all, biological functions in the cell. One of the research topics in our group is how this ubiquitin code is written.

We have now identified a new combination of enzymes that selectively produces a particular type of the ubiquitin chains and plays a role in the sorting of membrane proteins. Our data therefore provide insight into a process that is essential for cells to regulate their nutrient uptake and to respond to changes in their environment.

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

The biggest challenge of this project was to assign a physiological relevance to the new enzyme pair. Membrane transporter trafficking is a complex process with a high degree of redundancy, and our lab – focusing mainly on the contributions of ubiquitin to genome stability – has little experience in studying membrane proteins. To overcome this challenge, we teamed up with the group of Sébastien Léon in Paris. Sébastien and his team are experts in membrane trafficking and they helped us to dissect the biological significance of our biochemical observations.

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

My personal 'eureka' moment was when I observed the recruitment of the ubiquitylation enzyme Ubc13–Mms2 to its partner protein, Pib1, at endosomal and vacuolar membranes by microscopy. This result showed us that the ubiquitylation complex of Ubc13–Mms2 and Pib1 that we had observed *in vitro* is also identifiable in the physiological environment of a cell.

Christian Renz's contact details: IMB, Ackermannweg 4, 55128 Mainz, Germany.
E-mail: c.renz@imb-mainz.de

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

The Journal of Cell Science is an excellent home for studies that provide insight into fundamental aspects of cellular metabolism. Its emphasis on cell biology matches well with our approach of taking our initial biochemical observations back into cells to uncover their physiological relevance.

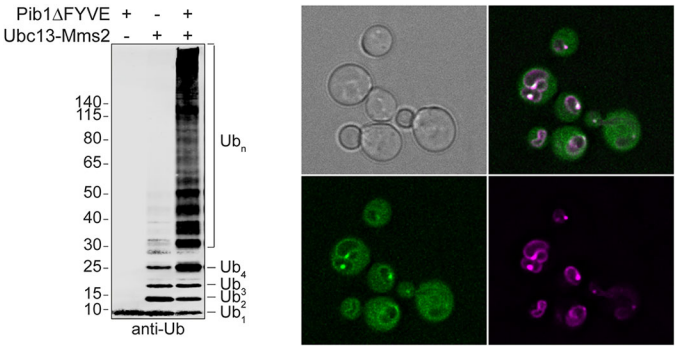
Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

Throughout my scientific career, I have always had great supervisors. My PhD supervisors, Nils Johnsson and Thomas Gronemeyer, showed me how to become an independent researcher, how to properly plan and execute experiments and how to develop my own research ideas. My current supervisor, Helle Ulrich, is giving me a lot of freedom to explore my research ideas, while fortunately – from time to time – reminding me not to overload myself with too many projects. Additionally, she is giving me a lot of insight into those tasks that group leaders have to face on a daily basis, which will be an excellent preparation for my next career move.

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 like to puzzle about complex problems and how to solve these. This is something researchers face each day. Additionally, I very much enjoy the atmosphere of working in a basic research institute, e.g. the busy atmosphere of the lab, the scientific and non-scientific discussions and the freedom to explore my ideas. I think all this and the combination of lab and desk work motivates me to pursue a career in science.

Journal of Cell Science (2020) 133, jcs247338. doi:10.1242/jcs.247338



The ubiquitylation complex of Ubc13–Mms2 and Pib1. Ubc13–Mms2 and Pib1 is active *in vitro* (left) and identifiable in the physiological environment of a cell (right; green: Ubc13–GFP, magenta: Pib1–mCherry).

For me, the most interesting moments were always when having the chance to present and discuss my results with the scientific community on conferences and other meetings. You always receive a lot of input for your research there.

What's next for you?

My medium-term goal is to become an independent group leader in basic research. At the moment, we are developing a new technology for the inducible substrate- and linkage-selective polyubiquitylation of any target protein *in vitro* or *in vivo*. This project was initiated during a 'crazy-idea brainstorming' session during a lab retreat in Riga.

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

I had a bad accident during the preparations for my wedding. My wife-to-be had to cancel the celebration on a notice of two days. Good news: our love was strong enough, we are now happily married and the big celebration will take place later this year.

Reference

Renz, C., Albanèse, V., Tröster, V., Albert, T. K., Santt, O., Jacobs, S. C., Khmelinskii, A., Léon, S., and Ulrich, H. D. (2020). Ubc13-Mms2 cooperates with a family of RING E3 proteins in membrane protein sorting. *J. Cell Sci.* **133**, jcs244566. doi:10.1242/jcs.244566