

## FIRST PERSON

# First person – Nicholas Maskalenko

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. Nicholas Maskalenko is first author on 'The DISC1–Girdin complex – a missing link in signaling to the T cell cytoskeleton', published in JCS. Nicholas is a postdoc in the lab of Martin Poenie at The University of Texas at Austin, investigating the activation and effector functions of immune cells.

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

T cells carry out their immune functions by forming transient physical connections with displaying foreign peptides on their surface. Intracellular signals generated when T cells bind these foreign peptides lead to numerous changes in the T cell, including formation of specialized arrangements of proteins known as the immunological synapse. We found that DISC1 and Girdin, two proteins that were previously undescribed in T cells, both generate signals and help orchestrate the assembly and function of various proteins at the immunological synapse. We found that Girdin, in particular, is needed for the formation of the classic actin ring seen at the synapse.

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

Cloning of DISC1 was initially a challenge, and several different approaches were tried before we succeeded. In order to study the function of DISC1, we initially used siRNA to deplete DISC1 but this was not very effective. We saw a transient reduction in DISC1 expression, but it recovered within hours. We finally succeeded knocking out DISC1 using the CRISPR/Cas9 approach.

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

There were actually several eureka moments. First was seeing the dramatic difference in distribution of the two DISC1 isoforms and finding one was associated with mitochondria and the other specifically associated with the dynein complex that went to the synapse. Secondly, we found that in the absence of DISC1 we lost the classic actin ring at the synapse. Finally, the finding that after activation DISC1 bound to talin went a long way to explaining many of our previous results showing the distribution of dynein and microtubules at the synapse.

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

I wanted our work published in a journal that has a reputation for publishing high quality research with a focus on cell biology.

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

Dr Martin Poenie has been a supportive mentor inside and outside of the lab. He guided me as I navigated the complicated world of

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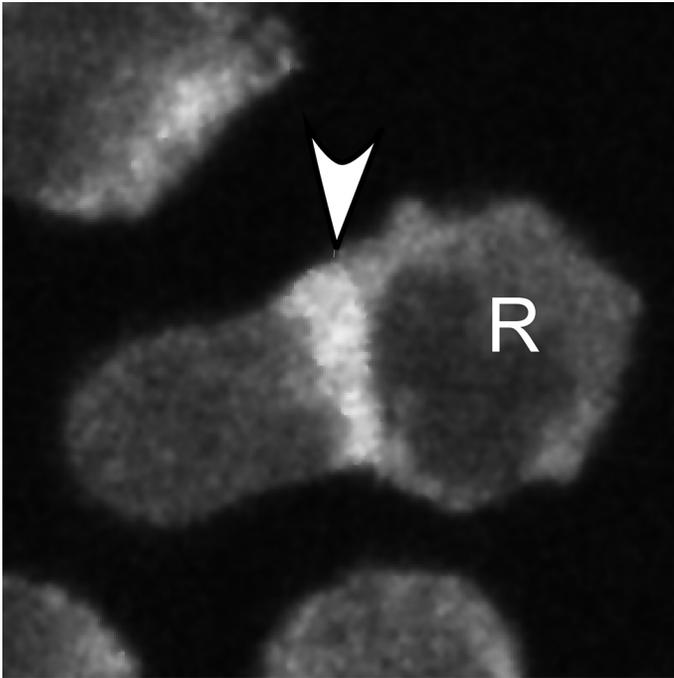
academia, offered constructive feedback during the writing process, and provided me with the direction and skills needed to teach students in class and in the laboratory. I am a better academic, writer, and educator because of his support.

### 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?

During my undergraduate cell biology course I became fascinated by how complex and organized the inside of the cell was and how so many individual proteins, lipids, and other signaling molecules were all needed to work in tandem. I wanted to learn more and was excited by how much was left for researchers to discover on the diversity of cellular function and the impact that these small molecular variations can have on our physiology and the development of disease. As I look forward to a career in science, I am enthusiastic about being able to add to that understanding.

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

Listening to scientists that have mentored me, like Drs Martin Poenie, Jeff Kuhn, and Yuri Sykulev, talk about their careers in science has inspired the beginnings of my own career. Understanding their successes and struggles has helped me reach my own milestones. I am thankful that our scientific community is filled with so many caring, intelligent individuals that are devoted to helping the next generation of scientists. That attitude has helped me greatly and I hope for the opportunity to pass that on when I reach a similar position.



Immunostaining shows the accumulation of DISC1 at the immunological synapse (arrow) of a Jurkat T cell bound to a Raji B cell target (R).

### What's next for you?

I will be starting a postdoc position at Thomas Jefferson University in Philadelphia. I hope to learn new techniques and connect with new colleagues who can introduce me to novel perspectives as I continue to pursue my career in science.

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

In college, I liked to grow common edible mushrooms (mostly oyster mushrooms and shiitake). Fortunately for my significant other, I no longer do that. Unfortunately for my significant other, I also like to collect flags, which I hang prominently in our apartment.

### Reference

Maskalenko, N., Nath, S., Ramakrishnan, A., Anikeeva, N., Sykulev, Y. and Poenie, M. (2020). The DISC1–Girdin complex – a missing link in signaling to the T cell cytoskeleton. *J. Cell Sci.* **133**, jcs242875. doi:10.1242/jcs.242875