Yasin Dagdas

Yasin Dagdas is a Group Leader at the Gregor Mendel Institute of Molecular Plant Biology, Vienna, Austria. The Dagdas Lab explores autophagy-mediated cellular quality control mechanisms in plants. Yasin was awarded the SEB's 2023 President's Medal for the Plant Section.

Tell us about your background. How did you first become interested in plant science and autophagy?

I am from Turkey, where I completed my Bachelor's and Master's degrees in Molecular Biology and Genetics at the Middle East Technical University in Ankara. I then pursued my PhD at the University of Exeter, where I studied plant-microbe interactions with Nick Talbot. My research focused on the development of the rice blast fungus during infection. After earning my PhD, I moved to the Sainsbury Laboratory in Norwich, UK to work in Sophien Kamoun's lab as a postdoc. There, I studied how effectors from the Irish potato famine pathogen subvert plant membrane trafficking pathways, including autophagy. In 2017, I became a group leader at the Gregor Mendel Institute in Vienna, where I have been exploring autophagy-mediated cellular quality control mechanisms in plants.

I became interested in plant sciences when I was in high school, while studying for Biology Olympiads. I learned English by translating *Life: The Science of Biology* word-by-word, and during this process I read Taiz and Zeigler's *Plant Physiology*, which cemented my desire to become a plant biologist. It was not until my postdoc at the Kamoun Lab that I became interested in autophagy. Tolga Bozkurt, who was then a postdoc in the lab, discovered that an effector protein from a plant pathogen could interact with a key autophagy protein. Together, we discovered how the Irish potato famine pathogen hijacked the autophagy-mediated defense responses of host plants. This experience highlighted for me how little is known about autophagy in plants and inspired me to focus on studying autophagy mechanisms that mediate stress tolerance and adaptation.

What is your lab working on currently?

Plant selective autophagy is largely unexplored territory. The molecular players that allow for the efficient recycling of damaged or unwanted cytoplasmic components are not yet fully understood. We are working to identify these missing pieces and to understand their functions using cellular and biochemical tools. In addition to these mechanistic studies, we also use comparative approaches, examining autophagy in different model organisms such as *Arabidopsis thaliana* and *Marchantia polymorpha*. These comparative studies help us to understand how different organisms use autophagy to meet their needs, and provide insights on how to optimize autophagy for improved stress tolerance.

What does a typical day look like for you?

I love the flexibility of being able to decide when and where to work and what to work on. I don't have a typical routine as an academic, but being a parent means I have to stick to certain daily routines. My childrens' school starts at 8 am, so I wake up around 6 am to get them ready. This allows me to be at work by 8 am. The lab is quiet until around 9:30-10:00, which is when I try to focus on tasks that require my full attention, like writing papers or grants. If there's a tight deadline, I'll often go to a Viennese coffee house to write, as the coffee and cakes fuel my motivation. After the writing frenzy ends, I talk with people in the lab about their experiments, have project meetings, or just grab coffee and chat about science. Our institute hosts many excellent seminars covering various aspects of molecular life sciences, so I try to attend them to hear about the latest breakthroughs and learn from other scientists. I finish the day around 5 pm to pick up my daughter from school, but may work a bit in the evenings or on weekends if needed.

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What do you most enjoy about your work?

The most enjoyable part of my work is planning new projects or experiments with the talented people I work with. I feel privileged to interact with very ambitious and brilliant students, postdocs, and group leaders on a daily basis. Watching their minds at work and sometimes even being able to help them is great fun.

What do you find most challenging?

One of the biggest challenges in academia is the insecurity. While we're encouraged to focus on high-risk, high-reward projects, the evaluation systems tend to prioritize short-term outputs. It's difficult to find places and positions that truly invest in you and allow you to follow your curiosity. Balancing these realities while doing research I enjoy can be draining, but the privilege of interacting with intelligent people from around the world outweighs the challenges. As the saying goes, "No pain, no gain."

What is your lab hoping to work on in the future?

In the future, we hope to evolve into an evolutionary cell biology lab and to use autophagy as a template to study how cellular innovations arise during evolution. Specifically, we want to understand how the autophagy pathway diversified since the last eukaryotic common ancestor. We believe that exploring beyond model organisms and sampling different branches of the eukaryotic tree of life could lead to significant discoveries in cell biology.

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What advice would you give to aspiring scientists in this area?

I have two pieces of advice for aspiring scientists in this field:

Firstly, choose your mentors wisely. It's difficult to predict which research questions will be "hot topics" when you start your lab, and it can be tempting to try and ride those waves for success. However, I recommend working with great mentors who will teach you how to do science, run a research group, and be a good member of the scientific community. I was lucky to have amazing mentors during my PhD and postdoc training, and I continue to see the impact of their guidance in my academic career every day.

Secondly, surround yourself with colleagues who care enough to criticize you. It's easy to say someone is doing well, but it's much harder to criticize them, especially when it comes to their science, which is close to their heart. When I started my lab, I had long conversations with my colleague Youssef Belkhadir, who would ask tough questions like, "Is this the best use of your resources?", "Is this the best use of your time?", and "Why should anyone care about this project?" Having colleagues who are willing to ask these questions can help you address potential issues early on and prevent bigger problems in the future.

Who are your scientific heroes?

My daily scientific heroes are the students and postdocs who present at our weekly Monday seminars. Most of them come from different parts of the world, adapt to living in a different country and, despite all these challenges, produce amazing science. On top of this, they also do an excellent job of explaining their research projects in a way that is accessible to a broad audience. These seminars, which I call my weekly imposter syndrome episodes, always leave me feeling inspired and motivated.

If I had to choose a historical figure, it would be Jacques Monod. I love reading about scientific history, and *Brave Genius* by Sean Carroll is one of my favorite books. It beautifully illustrates Monod's dual roles as a creative genius discovering the principles of gene expression and as a resistance commander fighting against the Nazi invasion. Don't you think we need more scientists like Monod who shaped both our scientific thinking and society?

Left: the Dagdas group.