© 2021. Published by The Company of Biologists Ltd | Journal of Cell Science (2021) 134, jcs259377. doi:10.1242/jcs.259377

CELL SCIENTISTS TO WATCH

Cell scientist to watch – Yasin Dagdas

Yasin Dagdas studied biotechnology at the Middle East Technical University in Ankara, Turkey. In 2009, he moved to the UK to join the lab of Nicholas Talbot for his PhD at University of Exeter. There, he studied the role of cellular morphogenesis in the pathogenicity of the rice blast fungus *Magnaporthe oryzae*. Yasin then did a postdoc with Sophien Kamoun from 2013–2016 at The Sainsbury Laboratory in Norwich, where he discovered how a plant pathogen effector has evolved to antagonize a host autophagy cargo receptor. In 2017, he established his own group at the Gregor Mendel Institute in Vienna. Research in his lab focusses on autophagy-mediated cellular quality control mechanisms in plants.

Yasin Dagdas

What inspired you to become a scientist?

I was studying for the Biology Olympiads in high school from university level textbooks such as Lehninger's Biochemistry or Alberts' Molecular Biology of the Cell when I was 13–14 years old. Already then, I always said I wanted to be a plant biologist. I loved reading the 'Biology of Plants' book by Peter Raven and Susan Eichhorn, which made me realise how cool plants are. Also, before we had our first child, I basically fainted when I saw blood, so medical studies were out of the equation for me anyways – deciding to do plant research was an easy choice.

Initially, was having an applied aspect to your research important for you? And what prompted your move to the UK to investigate the biology of plant infections for your PhD?

Indeed, having a clear applied aspect used to be the main driver of the research I was doing; especially in developing countries like Turkey, you are a bit forced to think that's the most important thing. For my master's, I was already studying plant–microbe interactions and working with a wheat pathogen, because wheat is an important crop in Turkey. But I realized that if I wanted to do the kind of science I read in papers, then I had to go abroad, because at the time in Turkey the resources and the infrastructure were not good enough, so research generally went very slowly. Therefore, I moved to the UK for my PhD and was quite happy to discover new aspects of infection-related development of a 'cereal killer' – a fungal pathogen killing the amount of rice that could feed 60 million people every year.

Your lab is now studying autophagy in plants; how did this change in topic come about?

For my postdoc, I decided to change fields a bit and focus more on the plant side of the plant–microbe interaction. Shifting topics is actually something I would highly encourage PhD students to do in order to get a new perspective. I happened to work on a mechanism where we showed that the Irish potato famine pathogen subverted host autophagy-mediated defences. I realized that there weren't many people studying selective autophagy in plants and there were tons of really open questions. My postdoc mentor, Sophien Kamoun, was very supportive and let his postdocs develop their own niche and ideas. So, I basically shifted again to focus solely on autophagy in my group. To some extent, we are now also going back to the pathogens and using viruses to discover new autophagy mechanisms.

Can you talk a bit more about what your lab is working on now?

There are three main directions in our lab. First, we really want to understand the molecular details of how autophagy works as a quality control system in plants, meaning how it mediates the removal of damaged or unnecessary components in plant cells. We just had our first paper out where we described mitochondrial recycling in plants, but we still know very little about the molecular mechanisms – and the same is true for the autophagy of other organelles, such as the ER or the chloroplast. A second direction, which is a general question in the autophagy field, aims to investigate cell type- or tissue-specific autophagy responses. For example, a stem cell will have different autophagy needs compared to a fully differentiated cell, and we are now trying to understand how manipulating autophagy in certain cell types will affect the neighbouring cells or the organism as a whole. Thirdly, we are doing comparative studies, which I'm a huge fan of. We have multiple plant species in the lab that cover a broad range of evolutionary time, and are looking into the evolution of autophagy, or 'evophagy' as I like to call it. The idea is to use the same stress

Yasin Dagdas's contact details: Gregor Mendel Institute of Molecular Plant Biology, Austrian Academy of Sciences, Dr. Bohr-Gasse 3, 1030 Vienna, Austria.
E-mail: yasin.dagdas@gmi.oeaw.ac.at

Journal of Cell Science (2021) 134, jcs259377. doi:10.1242/jcs.259377

Yasin with his current group working on their favourite model organism, the liverwort *Marchantia polymorpha*.

conditions and see how different plants across the evolutionary spectrum use autophagy to respond to them.

You mentioned that many molecular details for plant autophagy are unknown – is screening something that you do a lot and how do you decide on which candidates to follow up?

We did do a mass spectrometry-based screen for potential autophagy receptor candidates, which gave us quite a few hits. We've decided to prioritize the ones that are completely unknown, so this is kind of a 'high risk–high gain' approach. We also prioritize candidates that are conserved in mammalian cells, and that's why we recently focussed on the C53 autophagy receptor – in the paper, we actually show experiments in both plant and mammalian cells. So people who have completely ignored plants so far can see that by using plants you can still learn new biology that might be relevant to humans.

Do you feel there is often a barrier between researchers working on plant and animal model systems?

There sometimes is, but we are trying to cross this barrier as much as we can; after all, autophagy is autophagy. Sometimes, I feel that as plant scientists we are too much in a defensive mode, whereas we should actually be proud of working with plants and explain to others why we like studying them, instead of having the feeling that we keep on being ignored. Here at the Vienna Biocenter, when I talk to colleagues from the Ubiquitin Club or scientists who work on small RNAs, they really appreciate the kind of research that has been going on in plants in their respective fields. At an autophagy conference, I've also been approached after my talk by one of the leaders in the field who told me that he wished he could work on plants, as they have some amazing features and allow for conducting organismal studies, whereas some of the findings in mammalian cells are difficult to translate back to the organism level.

"Sometimes, I feel that as plant scientists we are too much in a defensive mode, whereas we should actually be proud of working with plants and explain to others why we like studying them…"

Given the volume of published research, it's increasingly difficult to keep up with the scientific literature. How do you choose what you read?

At the moment, if I look at the papers I want to read, my non-plant research pile is much larger than the plant research pile, but this is also because the mammalian and yeast cellular quality control field is very big. I do read a lot and mostly find papers through Twitter, which I think is an effective way of getting to the relevant information; for example, reading the 'tweetorials' from authors about their work is extremely informative. I used to get dozens of online table of contents alerts from different journals to my email, but I have basically unsubscribed from all of them.

You also enjoy reading books about science and beyond; could you tell us a bit more about that?

There are two main types of books I like reading; first, those that are related to personal development, because they allow me to reflect on what I'm doing and hopefully improve the way I develop projects or run the lab. Whether I like it or not, a big part of my job is to manage people and make decisions that affect their lives, so I think we have to take this seriously. If you ask me what I'm most worried about, it would be wasting the time of people, for example, by working on a question that doesn't matter much. The second type of book that I love reading is about science, for example evolutionary biology or science history. I think something we should be doing much more is daydreaming – we are often so obsessed with writing the next grant or are upset about a rejected paper that we forget to think about what kind of science would be really cool to do. And reading these science books really lets your imagination run wild. You can also feel the thrill of discovery in some of these books – for example I had goosebumps when reading 'The eighth day of creation', which is one of my favourites.

"…we should be doing much more is daydreaming – we are often so obsessed with writing the next grant or are upset about a rejected paper that we forget to think about what kind of science would be really cool to do."

What advice would you give someone who is about to start their lab?

I think my most important advice is to not be afraid to ask for help; when you start a lab, there is no way you will be able to do everything properly and you'll make mistakes, but at the end of the

Journal of Cell Science (2021) 134, jcs259377. doi:10.1242/jcs.259377

day, to solve many of the problems you will need help. I've seen that many colleagues are hesitant to ask for help, for various reasons, but it has really made a difference for me.

And is there any piece of advice you received that has stuck with you?

My postdoc mentor used to tell us that there are many different ways of doing good science, and the key is really to produce findings that will stand the test of time. This has been sort of the guiding principle of my lab; we always try to support each of our conclusions with multiple independent lines of evidence, using different approaches. I feel the community really appreciates solid science, so it's important to not rush things, even if we are evaluated on short time scales.

You're an advocate of preprints – what's your favourite thing about posting your work on bioRxiv?

The reason why I love preprints is that they allow me to enjoy publishing a paper. By the time you go through the hurdles of dealing with reviews, several rounds of edits and potentially rejections, you simply hate seeing the paper. The preprint goes online about a day after you submitted it, and you get to present the story and explain the findings exactly the way you want to. Once we have the preprint out there, the community can start to look at it and evaluate it and we can also move on to our next story. I really think it's a revolution in scientific publishing.

Finally, could you tell us an interesting fact about yourself that people wouldn't know by looking at your CV?

I love watching cooking competitions. One of the reasons is that chefs are going through a very similar kind of training period as scientists, and I feel they are working harder than any academic I have seen; being a chef requires a lot of dedication and effort and you need to love what you are doing and suffer through the process until you reach Michelin star level. Also, a good plate of food is quite similar to a good paper – you need to have balanced flavours that support each other.

Yasin Dagdas was interviewed by Máté Pálfy, Features & Reviews Editor at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.