

FIRST PERSON

First person – Gaurav Barve

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. Gaurav Barve is the first author on 'Septins are involved at the early stages of macroautophagy in *S. cerevisiae*', published in Journal of Cell Science. Gaurav is a PhD student in the laboratory of Ravi Manjithaya at Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India, investigating the role of septins in autophagy.

How would you explain the main findings of your paper to non-scientific family and friends?

This kind of study helps the general audience to understand that proteins can have multiple functions and helps them to comprehend how a cell works. These findings can be compared with a construction site where some workers do their job building a certain building in a certain area. But when the construction is done and demand increases in some other area these workers go there and start constructing the next building. We have described a moonlighting function of a septin protein complex that builds a septin ring between mother and daughter yeast cells for proper cell division. When cell division is no longer required, septins move to a new 'construction site' such as an autophagosome biogenesis site (also called a pre-autophagosome site), and start constructing a ring around the autophagosome, which helps in autophagosome formation.

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

Unlike existing cytoskeleton proteins, septins have been discovered relatively more recently and very little is known about the septin complex that is formed *in vivo*. With respect to autophagy, autophagosome biogenesis is still a grey zone. Therefore, it was challenging for us to deal with these two grey areas simultaneously. Now, one important challenge that still remains is to determine the composition of the septin complex involved in autophagy and how exactly autophagosome biogenesis happens.

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

In science, 'seeing is believing', and therefore live-cell microscopy carries a lot of importance. When I was performing the live-cell microscopy, I was very excited to see septins migrating from the bud-neck region to the cytoplasm, and how some of the autophagy proteins colocalize for a fraction of a second with septins and then go away.

Have you had any significant mentors, and how have they helped you?

Dr Ravi Manjithaya, my mentor, is not only helpful and but also someone who is ready to listen. We discussed many experiments and ideas to get to our goal and to overcome failures. Our weekly lab meetings helped to keep me on the right track and prevented me



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from getting involved in some unnecessarily time-consuming experiments. Dr Manjithaya suggested experiments that helped me to finish the story in time. He is very open to sharing ideas and collaborating. One example of a successful collaboration is with Dr Michael McMurray from University of Colorado. We shared our ideas about autophagy and Dr McMurray shared his ideas on septins, which helped us to understand the complete picture.

“...an arrow can go forward only after it is pulled backward.”

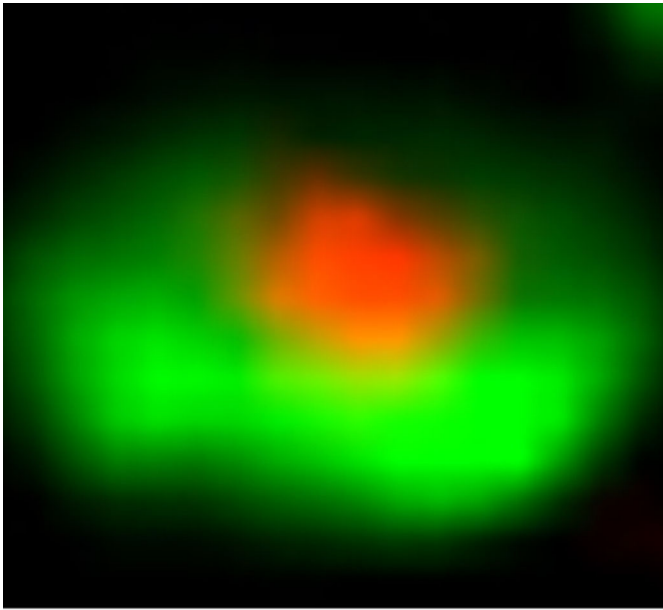
What's the most important piece of advice you would give first-year PhD students?

To begin with, read as much literature as you can about the projects that you are interested in. Then write a draft about your ideas, ask questions and follow them up. Another important point is about designing an experiment; you should design an experiment that will give you maximum information. Plan your work on a daily, weekly or monthly basis. Initially, only 5% to 10% of what you planned will happen but later on it will improve. Although this seems tough, taking 'baby steps' would help students to overcome frustration and stress during their PhD tenure. Sometimes failures will destroy you and you want to give up. Take one or two days off and get back to it. Remember: an arrow can go forward only after it is pulled backward.

What's next for you?

I would like to pursue my career in research. Our study has opened up many interesting questions, like how do septins migrate from the

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Septins (green) form a non-canonical ring around an autophagosome (red).

bud neck to the cytoplasm? Is there any post-translation modification involved? Is it dependent on microtubules? With respect to autophagy, I am interested in understanding how the pre-autophagosome site is formed. What is its nature? How does autophagosome biogenesis happen? In the future, I would be interested in finding answers to some of these questions

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

God has gifted me with very good observational skills. As a research student, I tend to observe details and, apart from science, I put these skills to use in mimicry, too. I am also good at beatboxing.

Reference

Barve, G., Sridhar, S., Aher, A., Sahani, M. H., Chinchwadkar, S., Singh, S., Lakshmeesha, K. N., McMurray, M. A. and Manjithaya, R. (2018). Septins are involved at the early stages of macroautophagy in *S. cerevisiae*. *J. Cell Sci.* **131**, jcs209098.