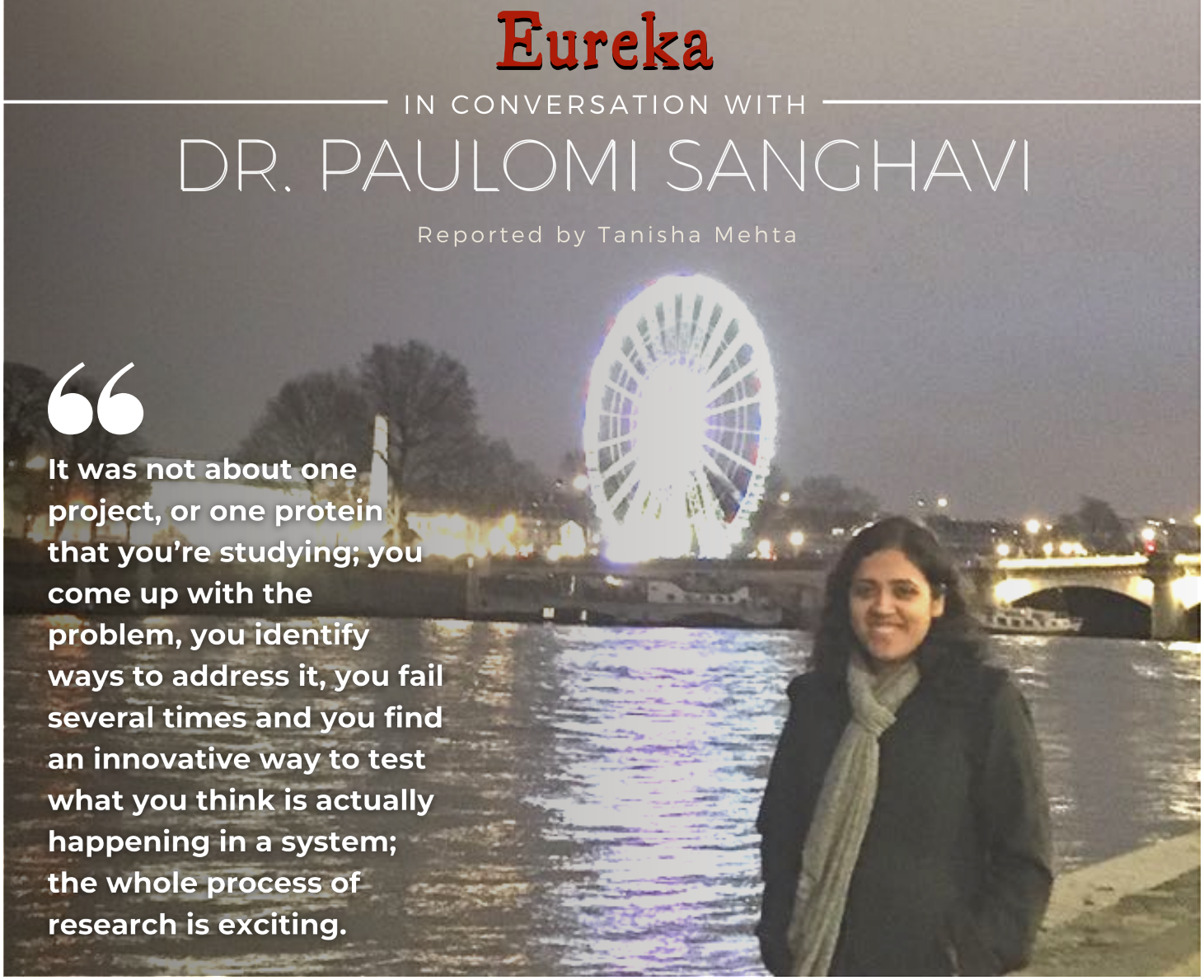
Eureka

IN CONVERSATION WITH

DR. PAULOMI SANGHAVI

Reported by Tanisha Mehta



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In this issue, we talk to Dr. Paulomi Sanghavi, a postdoctoral research scientist studying motor proteins, in the lab of Dr Roop Mallik at Department of Biosciences and Bioengineering, Indian Institute of Technology- Bombay (BSBE, IIT-B), formerly at the Department of Biological Science, Tata Institute of Fundamental Research, Mumbai (DBS, TIFR). We talk about what pursuing research beyond a PhD entails.

What was your educational journey to your postdoc and was there a change in environment from your Masters Degree in India to your PhD in the USA?

Having completed my B.Sc in Biotechnology from Ruia College, Mumbai University, I went on to pursue my M.Sc in Biochemistry from MSU, Baroda. I, then, went to Georgia, USA to do my PhD in Cell Biology.

Coming from a very little research oriented background, it was wonderful getting hands-on experience in the US. The environment there is slightly different. One cannot generalize but I felt even though you have a lot of freedom in US you are usually focused on one particular project at a time. I was my mentor's first PhD student in a new lab, so I was lucky to become a part of several different projects. Additionally in the US, there is more help available from common core facilities and collaborators, so things happen relatively faster.

As a master's student in India, I did a small dissertation project without really worrying about the funding. I would often make mistakes and repeat experiments until I got it right. Whereas during my PhD in the US, we didn't have funding in the beginning. So we were expected to be more productive even with less resources and limited time in hand. Things were tight but I think we explored the best we could.

When did you realize you wanted a career in biological research? Was there a point when you realized this is a career path rather than something you are studying?

If you like what you've been doing during your PhD, the obvious next step is to do a postdoc, if you want to make research a career. That happened to me during my PhD, where I was interested in the whole process of answering questions; it is not about one project, or one protein that you're studying; you come up with the problem, you identify ways to address it, you fail several times and eventually you find an innovative way to test what you think is actually happening in the system. This entire process is exciting. When you have done a few projects you enjoy, you think I want to do this for a different problem, using a different technique. During my postdoc, I felt like I enjoy this and I should do this for a living. At the same time, I want to have the freedom to take up whatever questions excites me - hence a career in academia. It has not happened yet, but I will definitely try for it!

What about the field of molecular and cell biology, and motor proteins has sustained your curiosity and interest?

Inside the body, cells have different functions; but they all have a set of proteins, RNAs and organelles which you can see moving from one location to the other, whether it is inside a brain cell or a liver cell. It is fascinating to study how these conserved motors keep everything moving. They are basically like local trains carrying biomolecules all around the city so cargoes reach the required site at the right time. This motion is what brings about different cellular functions such as wound healing, cell division, fighting infection etc. When these motors do not function properly, the consequences are severe resulting in lethality or disorders.

Our lab studies how motors function in a healthy cell when it is fighting infection, how different proteins help these motors to do their jobs and so on. Once we have that information, it can be used in different contexts to study and treat different disorders.

What was the transition from a PhD to a Postdoc position like?

Both the labs where I did my PhD and my Postdoc were great. I transitioned from working in a smaller lab to a much bigger lab with abundant resources. Although I was working on motor proteins since my PhD, the kind of questions and the approaches used to answer those questions used in my postdoc were pretty different. Also, I was the only student for a long time in my PhD lab and I wasn't used to working with more than two or three people. Over here, I was working with around eight people on the first day. So I wasn't sure how to take my space and get my experiments started. Initially that was one of the bigger worries I had, more than what results am I going to get, or what project I'll be working on.

Also, things are usually slower here. Many of the reagents that we use, like antibodies, chemicals come from overseas and hence it can take much longer to get work started. I'll finish cloning, but to get the clone sequenced, it can take about a week, whereas in the US, you place an order and you get what you need in the next couple of days. If you are asking a question you are able to answer it in a shorter time and if something is not going to work, you will know it sooner, and you can change your strategy. However, the good thing in India is everybody is aware and used to this problem so people work on several projects at the same time. You plan things much ahead in time and anticipate requirements. This keeps you on your toes and you are always thinking about the next experiment. That took some time to get used to.

How did your responsibility as a member of the lab change between the PhD and a Postdoc?

During my PhD because I had little research experience, I took my time to learn things, made my share of mistakes before I understood how to get things working or how to troubleshoot when I was stuck. I think as a postdoc, because you are experienced at working in the lab, more than others you expect yourself to be productive from early on. As a postdoc, you take responsibility for the project and its impact. You set your own timelines and the goals you want to accomplish in that time. Lab responsibility wise, I have to work with other students and guide them whenever they needed help. This is good training for me because it enabled me to teach students, something I haven't done much before. It also helped me learn a lot about myself and gave me a flavor of how things will be when I will train students in my lab.

What was your experience of working at TIFR, which is one of the country's foremost research institutes?

I had a great time at TIFR for the past five years. What I liked the most is that people are very approachable, with no hierarchy. People are very open to science; it is what everybody is thinking about. The biology department is a small close knit department and what I like is the drive for science in everyone. The department does not follow a common theme and everyone is diverse in the research they do. But I feel comfortable going to any of the labs and asking for what I need. That is the best thing about TIFR and I am going to miss it wherever I go next. The ease of working with others and the ease with which you can approach somebody including faculty members is impeccable.

Through your postdoc, have you mentored younger students? Have you enjoyed being a mentor?

I have worked with a lot of younger students, both Master's and PhD students. I still dont know the formula for mentoring but it has been quite enjoyable especially because they all come from different scientific backgrounds. Of course you teach them what you know but its even better when you get to learn something new from them. Also, it is also nice to see how with time, they evolve and come up with their own interesting way of doing things. They have expertise in different techniques, they have their own input and perspective on the project. So the experience of sharing data, working together, discussing and troubleshooting problems with them is great. Plus they are younger and usually quite enthusiastic about trying new things so having them around keeps the motivation of doing science high.

What has your relationship with your mentor been like? How has having Dr. Roop Mallik as your mentor helped you through your postdoc?

I have been very lucky to have great mentors, both during my PhD and postdoc and that has been instrumental in sustaining my interest in the field and biology in general.
Roop is not the kind of mentor who tells you exactly what to do. But he also has his way of making sure you are on track and wouldn't let you wander so far that you feel you are being unproductive, which is the best thing about him. He doesn't take away from you the freedom of trying different things. But you need to have one thing at hand that's working so you are productive and your research can get published. I can write to other scientists for any reagent or any kind of help and Roop would always be supportive. Most importantly, as a postdoc, you want a mentor who realises what your long term goals are beyond your project and who helps you achieve them. Roop does exactly that. He shows tremendous faith in his team and that pushes you to do your best.

The lab recently moved to IIT-B. What did that change?

It was exciting to move to a new place but it was also daunting initially to think we have to get things started from scratch. We think this is a great opportunity to get ideas and feedback from a group of scientists who do a different kind of research as compared to peers back in TIFR. Here we have very diverse research groups who work on basic biology, translational aspects of diseases, molecular simulations etc. It will be good to adopt some of their methodologies to our work and provide our expertise in their areas. There is also better access to different resources and analytical techniques like NMR, mass spectroscopy and electron microscopy. Using these, we think we will be able to explore new avenues and ask different kinds of questions in biology.

Do you see the next stage of your career being starting a lab of your own? What research practices have you learnt that you'd like to implement at your own lab?

Yes, I do think of having my own lab. Obtaining critical feedback on data from peers without feeling judged, discussing experimental plans with mentor so you know whatever you are doing will be useful, sharing new developments within and outside the field with regular journal clubs, having an open access to resources for all lab members, promoting collaboration with others are some of the good practices I would like to continue in my own lab as well.

Interviewer's Note

It was lovely talking to Dr. Paulomi for this interview. We often hear the perspectives of scientists through interviews but there is little information about the experiences of postdoc researchers, who have spent a long time in academia and are on the path to establish their career as researchers. Hopefully this interview is as insightful to the readers as it has been for me.