

FIRST PERSON

First person – Bharti Nawalpuri

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. Bharti Nawalpuri is first author on 'Distinct temporal expression of the GW182 paralogue TNRC6A in neurons regulates dendritic arborization', published in JCS. Bharti is a PhD student in the lab of Dr Ravi S. Muddashetty at the Centre for Brain Research, Indian Institute of Science, Bangalore, India, investigating mechanisms of translation regulation in neurodevelopment and synaptic plasticity.

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

Dendrites act as the primary sites of information reception and integration in the nervous system. The dendritic network plays a pivotal role in information processing and is responsible for memory formation and consolidation. Thus, the process of dendrite development is tightly controlled and fine-tuned spatially and temporally through regulation of protein synthesis. In our work, we demonstrated that the protein GW182 is one of the regulators of protein synthesis that is important during early dendritic development. We found that the expression of GW182 is tightly regulated during neuronal development, with relatively low expression in the mature nervous system. Furthermore, we observed that GW182 regulates early dendritic development by modulating the expression of the protein LIMK1, which in turn regulates the neuronal actin cytoskeleton. Overall, we found that the temporally controlled expression of GW182 plays a crucial role in regulating dendritic growth and branching.

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

A particular challenge was obtaining western blots for GW182 protein from brain tissue. GW182 is a high molecular weight scaffolding protein, and it always used to go into the pellet fraction following cell lysis with the usual detergent concentration of 1%. To solve this, I had to standardize an effective detergent concentration in order to obtain GW182 in lysates. Ultimately, we used 0.3% NP-40 in all our experiments with brain tissues.

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

I was astounded after seeing the immunostaining of GW182 in rat cerebellar slices, where there was a visually detectable reduction in dendritic GW182 levels from postnatal day 15 to postnatal day 30. This was the result that really encouraged us to pursue the dendritic function of GW182.

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

Journal of Cell Science is a reputed journal, publishing articles on diverse topics in cell and molecular biology. I have always been impressed by the articles published in Journal of Cell Science that combine molecular biology and imaging techniques. We believe



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that our work investigating the neurodevelopmental function of GW182 will be of general interest to developmental biologists and to molecular neuro/cell biologists, and thus found Journal of Cell Science suitable for publishing our work.

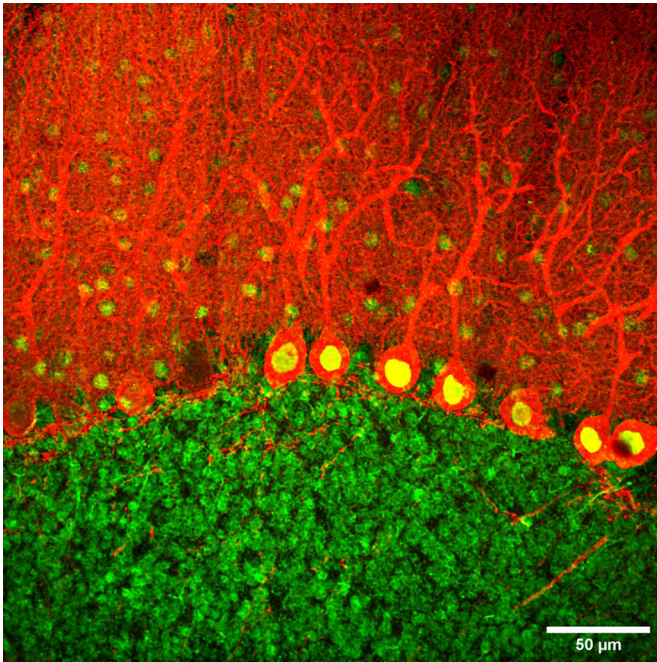
Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

"If it disagrees with experiment, it's wrong. In that simple statement is the key to science." – Richard Feynman. This is also the scientific approach of my PhD supervisor, Dr Ravi Muddashetty. Ravi has been an excellent mentor and has played a significant role in shaping my scientific thinking and attitude. He has always been very encouraging and supportive. His passion for science and his optimism to see the silver lining has taught me to continue working towards my goals irrespective of difficult situations. He has always provided me with constant support and guidance and at the same time with the scientific freedom to explore different ideas. Prior to the start of my PhD, I worked with Dr Alo Nag during my master's degree. As my first research mentor, she taught me the importance of a systematic approach and rigor in pursuing scientific problems.

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?

The primary motivation behind pursuing a scientific career was my curiosity to understand the working of day-to-day things around me. My fascination with the field of neuroscience grew during my undergraduate studies when I started reading the work of Dr Oliver Sacks and Dr V. S. Ramachandran.

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Immunostaining of a cerebellum section from a rat at postnatal day 30 showing calbindin (red) and GW182 (green).

Who are your role models in science? Why?

I have always been fascinated by the remarkable observational skills of scientists like Gregor Mendel and Ramón y Cajal. I immensely enjoy reading the work and scientific methodology of Dr Richard Feynman. During daily operations, I look up to my PhD supervisor Dr Ravi Muddashetty as an individual as well as a researcher. I really admire his passion for and approach to doing science, along with his kind and compassionate attitude towards his mentees.

What's next for you?

I plan to continue in academia, and I am currently looking for a postdoctoral position in the field of translational neuroscience and neuroimmunology.

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

In my leisure time I like to listen to and read Urdu and Hindi poetry. I enjoy being outdoors and taking strolls, it really helps me clear my mind.

Reference

Nawalpuri, B., Sharma, A., Chattarji, S. and Muddashetty, R. S. (2021). Distinct temporal expression of the GW182 paralog TNRC6A in neurons regulates dendritic arborization. *J. Cell Sci.* **134**, jcs258465. doi:10.1242/jcs.258465