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FIRST PERSON

First person – Parisa Naeli

First Person is a series of interviews with the first authors of a selection of papers published in Journal of Cell Science, helping researchers promote themselves alongside their papers. Parisa Naeli is first author on 'The SARS-CoV-2 protein NSP2 enhances microRNA-mediated translational repression', published in JCS. Parisa is a postdoctoral researcher in the lab of Seyed Mehdi Jafarnejad at Queen's University Belfast, UK, investigating mRNA translation and decay, RNA biology, and RNA-binding proteins.

Parisa Naeli

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

Viruses are responsible for a wide range of human diseases, and they exhibit a unique characteristic of only being viable within host cells. To thrive, viruses have developed mechanisms aimed at hijacking the host cell's resources for their replication. In response, host cells have evolved immune defences to eliminate infected cells. Viruses, in turn, employ strategies to subvert host immune responses, often targeting gene regulatory pathways. microRNAs, a class of gene expression regulators, are frequently exploited by viruses in this regard.

In this study, we have unveiled an additional layer of the intricate mechanism employed by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes the COVID-19 disease, to manipulate the host's gene expression programme. This is achieved by a key viral protein called NSP2, which interferes with production of cellular proteins. More specifically, NSP2 hijacks the cellular machinery that enables microRNAs to regulate and reprogramme the activity of other cellular genes in order to benefit the virus. This discovery sheds light on the sophisticated strategies used by these viruses to evade antiviral defences.

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

Time was the main challenge for me. I had to change my priorities and switch my main focus from another project to this one.

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

My eureka moment of this project happened when I did the first replicate of NSP2 immunoprecipitation and I could see the pull-down of NSP2 with AGO2, a core component of the microRNA-induced silencing machinery. This meant that NSP2 could potentially influence almost every single mRNA in the cells, which indicates its great potential to reprogramme gene expression patterns.

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

I found that the scope of Journal of Cell Science aligns well with my research. Moreover, the journal's reputation within the academic community and quality of published papers played a significant role in our decision. Besides that, we felt that our paper would be interesting for scientists from different fields, ranging from virology to RNA biology and mRNA translation regulation, and Journal of Cell Science would be a good platform to share our research with many different scientists.

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

I had the privilege of working under the guidance of Dr Seyed Mehdi Jafarnejad. He helped not only with insightful input and experiment designs for this paper, but also with various aspects of my academic career such as grant writing, presentation skills and paper writing. I'm also greatly thankful for being mentored by great scientists beyond the lab. While we were doing the experiments, I was lucky to be able to share the data and receive comments from our collaborators Professor Sonenberg and Professor Duchaine, two of the best researchers in the field of mRNA translation regulation and microRNA.

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?

There's always something new and exciting in science; a new question that you can look for an answer for. I'm not a person who enjoys a routine lifestyle and repeating the same thing every day. I feel when you are in science, even if you are replicating the same experiment, there's always a bit of excitement in it. You are excited to see the results, and this excitement is pleasant for me.

What's next for you?

As a postdoc who loves doing science, I would love to continue in academia, apply for a grant and establish my own lab. Currently I'm working if the field of RNA biology and mRNA translation regulation, and I would love to continue in this field.

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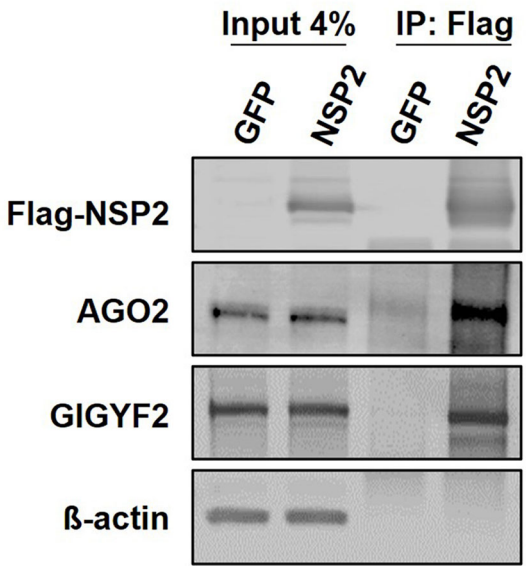

NSP2 interacts with AGO2, a main component of the miRNA regulatory pathway. Although the NSP2 interactome had been explored before, here I could see the interaction of NSP2 with AGO2 for the first time, suggesting that NSP2 could manipulate gene regulation through miRNA-induced silencing.

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

I have a keen interest in travelling, particularly to historical places and cities with exceptional architecture. Cooking and reading are always relaxing for me, and I'm a big fan of documentaries. Sometimes when I feel overwhelmed, I just put my headphones on and go for a walk while listening to music.

Reference

Naeli, P., Zhang, X., Harris Snell, P., Chatterjee, S., Kamran, M., Ladak, R. J., Orr, N., Duchaine, T., Sonenberg, N. and Jafarnejad, S. M. (2023). The SARS-CoV-2 protein NSP2 enhances microRNA-mediated translational repression. *J. Cell Sci.* **136**, jcs261286. doi:10.1242/jcs.261286