

## FIRST PERSON

# First person – Shan Ying

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. Shan Ying is first author on 'UV damage induces G3BP1-dependent stress granule formation that is not driven by mTOR inhibition-mediated translation arrest', published in JCS. Shan is a research assistant in the lab of Denys Khaperskyy at Department of Microbiology and Immunology, Dalhousie University, Halifax, Canada where her research interests focus on understanding properties and functions of stress granules and the molecular mechanism of viral host shutoff.

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

Stress granules (SGs) are the complex condensates of RNA and proteins formed in cells in response to stress. In our work, we analyzed SG formation caused by damage induced by ultraviolet light (UV). We demonstrated that the UV-induced SG formation is different from other types of SGs, both with regard to their composition and the requirements for cellular signaling pathways that control protein synthesis. At the same time, the condensation of UV-induced SGs still required the most-common SG-nucleating protein called G3BP1.

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

I used to be a plant biotechnologist working on improving crop performance through plant transformation. When I started this project, I didn't have any experience with several key techniques that we used throughout this paper, such as immunofluorescence microscopy and western blotting. I am grateful to my supervisor Dr Denys Khaperskyy for his trust, help and support. Now I am very confident using these techniques in my research!

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

Early on, we found that, when GCN2 was silenced by siRNA-1, UV-induced SG formation was blocked very efficiently. However, when we used a different siRNA that was just as efficient in silencing GCN2, SG formation was inhibited much less. To convince ourselves that our results were real, we used another approach, CRISPR/Cas9, to knockout GCN2 completely. We also stressed the cells with arsenite – a different SG inducer – and observed that the SGs formation was not affected in all cell lines, except when transfected with siRNA-1. This revealed a strong unknown off-target effect of siRNA-1. We then discovered that GCN2 activity is dispensable for SG formation when cells undergo division at the time of UV exposure, but is required in interphase cells.

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

Me and my supervisor chose JCS for our work because it has published several important studies on SG formation. JCS is a great journal and our research findings fit well with its 'aims and scope'.

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We thank the Editor and Reviewers at JCS for their comments and appreciate their help in making our paper better.

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

My previous colleague Tishu Cai (Mrs Cai), who was 72 years old when we were working on the tissue culture room together at Syngenta. Working beside me, she was a real example of someone who devoted her life to science. I also learned from her that people often have, on average, six different job positions in their lifetime. I find I feel less anxiety when I need to move to another job. Now, change means new experiences and more opportunities. I like these challenges.

### 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?

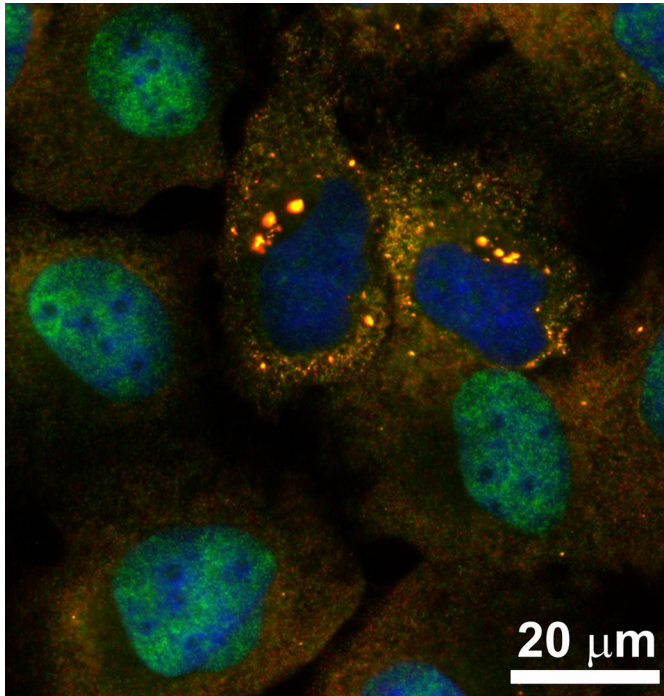
Discovering the unknowns in the molecular world always attracted me. I was brought up in a small village in China. My research interest started from bringing plant potential to life (to produce more food). A volunteer experience in a research lab in Faculty of Medicine at Dalhousie University guided me to the field of molecular and cellular virology. After witnessing the catastrophic impact of the pandemic, I'm pretty sure my research interest has been switched.

### Who are your role models in science? Why?

My role model in science is Marie Curie, who was the first woman to win a Nobel Prize, the first person and the only woman to win the Nobel Prize twice, and the only person to win the Nobel Prize in two scientific fields.

### What's next for you?

This is my second year working at Khaperskyy lab at Dalhousie University. I have learned a lot of new stuff and am having a great time here. If possible, I would like to continue my research exploration at Khaperskyy lab, aiming to decode more of the 'morse



**Immunofluorescence microscopy image of GCN2-deficient U2OS cells at 6 h post-exposure to UV light.** Only cells that had undergone division within this time frame formed stress granules co-stained with antibodies against TIAR (green) and G3BP1 (red). They are the two cells with predominantly cytoplasmic TIAR. Nuclei were stained with Hoechst dye (blue).

codes' that viruses use to communicate with host cells, and ultimately, to use or intercept those signals to mitigate/prevent harm caused by virus infection.

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

After work, I like spending time with my family, reading, cooking, baking, gardening, biking and hiking. Here are the dialogues between my 3-year-old little one and my neighbor (narrated by my husband on one Saturday morning): "Good morning, Mason./ Good morning, Cathy. My mom is still sleeping..." Actually, I'm 'the early mommy bird' the other 364 days of the year. I did plan to enjoy my birthday brunch at 11 am that day, but quietly and silently. Ha ha ha... I'm enjoying my spare time with my family, of course, including those 'kind of embarrassing moments brought by my two funny naughty boys'.

#### **Reference**

Ying, S. and Khaperskyy, D. A. (2020). UV damage induces G3BP1-dependent stress granule formation that is not driven by mTOR inhibition-mediated translation arrest. *J. Cell Sci.* **133**, jcs248310. doi:10.1242/jcs.248310