

## FIRST PERSON

# First person – Viorica Raluca Contu

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. Viorica Raluca Contu is co-first author on 'Lysosomal targeting of SIDT2 via multiple YxxΦ motifs is required for SIDT2 function in the process of RNautophagy', published in Journal of Cell Science. Viorica is a PhD student at the National Institute of Neuroscience, NCNP, Japan, investigating intracellular RNA degradation by the lysosomes and its possible involvements in disease pathogenesis and treatment.

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

The human body is made up of trillions of cells. Each cell is an independent unit containing substructures called organelles, delimited by a lipid bilayer membrane, that perform specific functions to maintain the internal stability of cells. For instance, lysosomes are the major organelles in charge of macromolecule (nucleic acids, proteins, carbohydrates and lipids) breakdown. Macromolecules play various roles, similar to the structural components in engines. Production of RNA or proteins is indispensable for cells, and degradation of these macromolecules is also essential. In fact, dysfunction of degradation pathways is known to be involved in various human diseases.

We have previously discovered that lysosomes directly take up RNA for degradation in a process named RNautophagy, and that the protein SIDT2 facilitates this process. This study revealed that localization of SIDT2 on the lysosomal membrane is necessary for the function of SIDT2 in the process of RNautophagy in cells and *in vitro*. We also reported the molecular mechanisms that underlie localization of SIDT2 to lysosomes and we found that excessive expression of SIDT2 strongly boosts RNA degradation in cells. Abnormal expression of RNA is related to various incurable diseases and SIDT2 may be an efficient target to develop new therapies, although further research is needed.

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

One was when I first obtained the result that SIDT2<sup>3YS</sup>, the SIDT2 mutant that does not reside on the lysosomal membrane, does not boost intracellular RNA degradation as the wild-type does. I invested approximately two months to get the license necessary for performing experiments using radioisotopes, and to find the most suitable experimental conditions to investigate the effect of SIDT2 overexpression on intracellular RNA degradation at the cellular level. When I saw the result, I felt much more confident that SIDT2<sup>3YS</sup>, my everyday companion during my PhD, indeed does not localize to the lysosomal membrane and does not influence RNA degradation at the cellular level.

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The other one was when one of my team members used SIDT2<sup>3YS</sup> in a set of experiments completely different to the ones I performed, and obtained similar results. That gave me full conviction that my results are real.

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

My PhD project was completely different to that of my master's degree and my supervisor, Dr Tomohiro Kabuta, had to teach me practically everything, almost from zero. He was patient and supportive, always making sure that I was getting everything right. If I got stuck with experiments, he would provide me with very helpful advice right away. He also helped me with the revised experiments for this paper and I must say that if not for him, I might have not made it by the deadline. Another thing I learned from Dr Kabuta, for which I am also very grateful, is how to be productive and how to write and structure grant applications. I am originally from Romania, a Latin country, and we young Romanians tend to be a little too emotional in our actions. I work and write with passion and that is not always beneficial in research. My supervisor's strong pragmatism was just right to keep me on track and make me a successful PhD student.

**“Technical and experimental skills for a researcher are like surgical techniques for a surgeon.”**

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

Not to close themselves off in the laboratory. I would advise them to go out, travel, participate in science events, visit life science museums, talk to other researchers, make connections and so on.



Delocalization of SIDT2 from the lysosomes by interruption of three YxxΦ motifs.

But at the same time, don't forget to acquire as many good technical and experimental skills as possible. Technical and experimental skills for a researcher are like surgical techniques for a surgeon.

### What changes do you think could improve the professional lives of early-career scientists?

I think that more professional stability would be great for early-career scientists. A fellowship for one to three years in a laboratory, followed by another fellowship for approximately the same length of time in another laboratory and so on, applies pressure on scientists. Pressure is not always a good companion when innovative ideas are needed, as in the case of science development. I think that fellowships for longer periods of time would be better to offer stability to young scientists, so that they can go deeper into the project and come out with innovation.

### What's next for you?

I will get my PhD next year in March. After that, I am planning to work as a postdoctoral fellow with my supervisor until I finish the new project I have just started. Then, I will probably look for a new laboratory somewhere in Europe so I can be closer to my family.

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

When I am stressed or after I have had a hard day, I love to eat chicken flappers with raw garlic paste flavored with salt, olive oil, and lemon. I buy a pack of chicken wings from the supermarket, then fry all the flappers at home and enjoy them with a lot of garlic and polenta. My mood becomes excellent, though I probably smell of garlic the next day.

### Reference

Raluca Contu, V., Hase, K., Kozuka-Hata, H., Oyama, M., Fujiwara, Y., Kabuta, C., Takahashi, M., Hakuno, F., Takahashi, S.-I., Wada, K. et al. (2017). Lysosomal targeting of SIDT2 via multiple YxxΦ motifs is required for SIDT2 function in the process of RNautophagy. *J. Cell Sci.* **130**, 2843-2853.