

FIRST PERSON

First person – Chen Yu

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. Chen Yu is first author on 'Annexin A5 regulates surface $\alpha\beta 5$ integrin for retinal clearance phagocytosis', published in JCS. Chen conducted the research described in this article while a PhD student in Silvia C. Finnemann's lab at Department of Biological Sciences, Fordham University, NY. He is now a Postdoc in the lab of Daniel R. Saban at Department of Ophthalmology, Duke Eye Center, NC, where he works to decipher the interactions of immune cells with retinal pigment epithelium and neurons that underlie retinal degeneration.

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

The life-long renewal of photoreceptors, the light-sensing neurons in the eye, is essential for vision. The retinal pigment epithelium (RPE) beneath the photoreceptors clears the aged ends of photoreceptors daily through receptor-mediated phagocytosis. RPE cells may be the most active phagocytes in the body. In this project, we identified the protein annexin A5 as an important regulator in retinal clearance by the RPE. We also found that annexin A5 interacts with the critical receptors, called $\alpha\beta 5$ integrin, in the RPE through conserved protein sequences and regulates its surface level. In absence of $\alpha\beta 5$ integrin, animals without annexin A5 develop abnormal turnover of photoreceptors. These findings reveal a novel and essential role of annexin A5 in photoreceptor turnover and maintenance of vision.

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

The time I spent figuring out a 'true' immunofluorescence staining was astonishing. I could not have imagined how many signals we saw in western blots and immunocytochemistry that might not be real. After testing six different antibodies with various fixation and permeabilization conditions, I finally found a specific one, which I could validate in knockout tissues. This story also reminds me of words from my PhD mentor, Dr Finnemann. She said there was no standard protocol for many experiments, and any change in your assay might affect your results.

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

This project started with a direct comparison of two proteins in annexin family, annexin A5 and annexin A6, both of which share the binding motif for $\alpha\beta 5$, critical receptors for RPE phagocytosis.

Chen Yu's contact details: Department of Ophthalmology, Duke Eye Center, 2351 Erwin Road, AERI 3rd floor, Durham, NC 27710, USA.
E-mail: chen.yu606@duke.edu



Chen Yu

To our surprise, we found that only annexin A5, but not annexin A6, contributes to clearance phagocytosis *in vitro* and *in vivo*, and the unique annexin A5 sequence is dispensable for this function. Sometimes, the complexity of cell biology is beyond sequences.

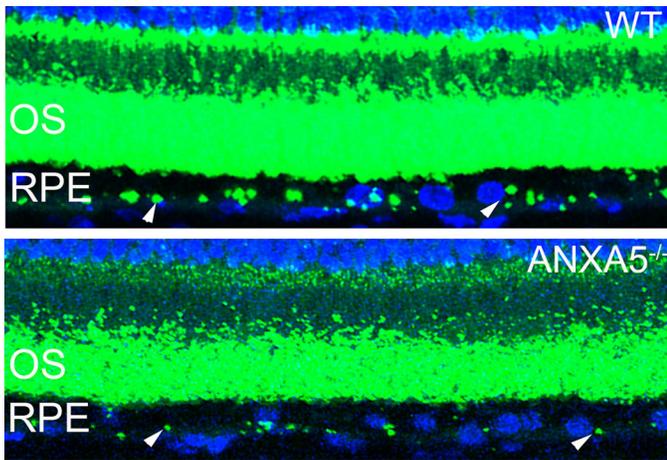
Why did you choose Journal of Cell Science for your paper?

Journal of Cell Science is a highly reputed journal for the scientific excellence of its papers. The papers published in this journal always deliver exciting take-home messages for researchers in different fields. Also, our research studies clearance phagocytosis (also known as efferocytosis), which is an evolutionarily conserved process found in RPE cells and many other cell types. Our findings provide new perspective to understanding the cellular functions of annexin family in this process, which is a perfect fit with the scope of this journal.

Sometimes, the complexity of cell biology is beyond [protein] sequences

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

I would like to thank my mentor for my doctoral thesis, Dr Silvia Finnemann. She helps me grow not only professionally but also



Annexin A5-deficient mice have abnormal clearance phagocytosis by the retinal pigment epithelium.

personally. She gives me a lot of her valuable guidance, and really sets an example for me for how to think rationally and what good science should be. Moreover, she establishes an open and friendly lab environment and always provides considerable support and constant encouragement. In the meantime, she often shares her experience about how to succeed as a foreigner in the United States and gives advice for my career development. I feel very fortunate to be working in her lab and to have her as my mentor.

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 science classes I took in China initially opened my mind to explore this wonderful world. Later, it was a very important decision for me to study abroad when finishing college. During this journey, there were so many interesting moments that I would like to share: getting accepted to a PhD program, publishing my first paper, attending my first conference, being recognized with my first

research award and earning my PhD degree. Nothing seems very special for me, but it is the path that leads to where I am now.

Who are your role models in science? Why?

I have a lot of role models in science. Many of them share a lot of inspirational qualities in common for science: scientific rigor, out-of-the-box thinking, attention to detail, great dedication and so on. Additionally, I feel I can always learn different perspectives from different people. What I learned recently is the importance of communication skills for research. Although good science can speak for itself, good communication will make it even more impactful.

What's next for you?

Since finishing my doctoral degree I have been working as a postdoc at Duke University, USA. I have been fascinated by the interactions between different cell types in our body, especially immune cells. My current project aims to understand how the interaction of immune cells (primarily microglia) with retinal neurons and the RPE maintains vision and how these mechanisms deteriorate with eye disease. I feel pretty happy about this project, as I can apply what I learned in my doctoral study to understand the pathology of human retinal degeneration, and at the same time I am learning new techniques such as single-cell RNA-seq and high dimensional flow cytometry.

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

Before, I did not pay enough attention to my health for several years and began to feel uncomfortable about my body. Now, I am very keen on gym workouts. In the past two years, I have lost more than 30 pounds and I feel healthier. The gym is a great place to relax a little bit from science work and become re-energized, which I think makes me more productive in my research!

Reference

Yu, C., Muñoz, L. E., Mallavarapu, M., Herrmann, M. and Finnemann, S. C. (2019). Annexin A5 regulates surface $\alpha\beta 5$ integrin for retinal clearance phagocytosis. *J. Cell Sci.* **132**, jcs232439. doi:10.1242/jcs.232439