

FIRST PERSON

First person – Thomas Williams

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. Thomas Williams is the first author on 'The physiological regulation of macropinocytosis during *Dictyostelium* growth and development', published in Journal of Cell Science. Thomas is a post-doctoral researcher in the lab of Dr Robert Kay at the MRC Laboratory of Molecular Biology, Cambridge, UK, investigating the molecular mechanisms of macropinocytosis from cup formation to internalisation.

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

In this paper, I developed a method for measuring the macropinocytosis (cell drinking) by *Dictyostelium* amoebae where multiple conditions and mutants could be tested side-by-side. This then allowed me to find which nutrients would make the cells drink more, by screening them individually. Blocking cell drinking using inhibitors showed us that nutrients were very likely sensed following cell drinking, and that these nutrients were also necessary to regulate cell drinking. When nutrients were removed from cells, they carried on drinking unless they were given food (bacteria) or allowed to enter multicellular development.

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

Establishing the flow cytometry assay was a challenge, but I was helped immensely by having a PI with an encyclopedic knowledge of the literature who could instantly point to possible solutions from previously published work. After that, it was just a matter of testing everything.

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

“[...] what was originally a minor control turned out to be quite an important result”

Two things stand out. The day I walked into the flow cytometry room and found someone using the plate reader to analyse lots of samples was a eureka moment. I hadn't realised this was possible before, and could immediately see the possibilities of scaling up my data collection, allowing studies like this one. The result that sticks with me is finding that cells still macropinocytose when nutrients are removed but no alternative food source or developmental signals are activated. This was a huge surprise to me and what was originally a minor control turned out to be quite an important result.

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Thomas Williams

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

When I joined the lab there was a wonderful postdoc, Douwe Veltman, who was fabulously helpful, patiently helping me improve my microscopy, cloning and mutagenesis. I also always remember the (slightly depressing) first words I was told by Julian Davies (University of British Columbia, Vancouver, BC) when I was an undergraduate visiting his group, "The cells are in charge of your life now".

“Keep yourself open to possibilities and [...] allow the results to guide you”

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

Keep yourself open to possibilities and don't have tunnel vision for your project – it may be that something comes up which is more interesting and/or successful than what you planned to do, and you should allow the results to guide you.

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

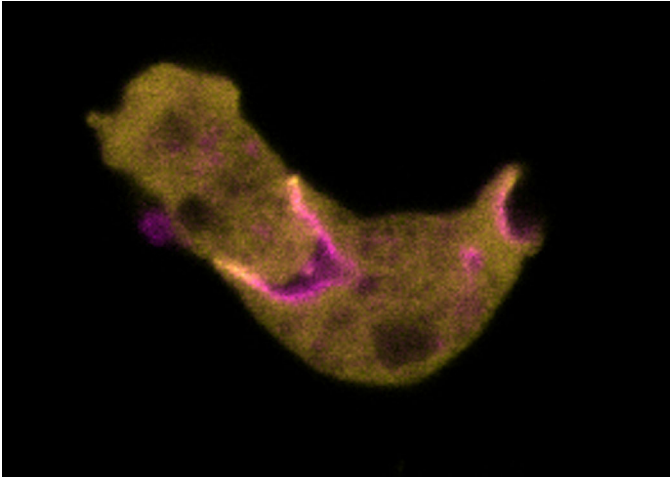
To reduce the pressure to publish and move on to a new position, I would like to see longer contracts. This would hopefully also allow more in-depth research to be done.

What's next for you?

I hope to continue working on macropinocytosis by *Dictyostelium*, as well as branching out into mammalian systems.

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

I'm a member of the infamous sourtoe cocktail club. To join you have to drink a 'cocktail' of whisky containing a dehydrated toe.



A vegetative *Dictyostelium* cell with a macropinocytic cup and a large phagocytic patch around a second cell. PIP3 is shown in magenta, SCAR/WAVE in yellow.

Reference

Williams, T. D. and Kay, R. R. (2018). The physiological regulation of macropinocytosis during *Dictyostelium* growth and development. *J. Cell Sci.* **131**, jcs213736.