© 2018. Published by The Company of Biologists Ltd | Journal of Cell Science (2018) 131, jcs221770. doi:10.1242/jcs.221770

FIRST PERSON

First person – Phatthamon Lapanuwat

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. Phatthamon Lapanuwat is the first author on 'Cyclin D1 depletion interferes with oxidative balance and promotes cancer cell senescence', published in Journal of Cell Science. Phatthamon is a PhD student in the lab of Siwanon Jirawatnotai at Siriraj Medical School, Bangkok, Thailand, investigating the cell cycle and cancer metabolism.

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

The production of new cells, or cell division, involves several well-regulated molecular and cellular processes including the cell cycle, metabolic balance, the DNA damage response and gene expression. Cyclin D1 was initially discovered as a key protein that controls the cell cycle. However, recent evidence indicates that cyclin D1 may be a holistic regulator of the processes associated with cell division. Here, we uncovered a novel non-cell-cycle-related role of cyclin D1 in maintaining the stress caused by oxygen imbalance at a low (non-harmful) level for the cancer cells. This role is essential for cancer cell survival, since removal of cyclin D1 from the cancer cells causes permanent cancer cell arrest, so-called 'cellular senescence'. This finding might explain why high levels of cyclin D1 are often detected in cancer. In addition, it highlights cyclin D1 as a multitasking cancer-promoting protein that might be targeted for cancer treatment in the future.

"Once we showed that inhibition of cyclin D1 in pRB-negative cells also promoted senescence, […] people started to get excited about our results"

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

It has been observed in our lab for some time that removal of cyclin D1 in certain cancer cells will consistently cause quick and dramatic cellular senescence, which is associated with elevated levels of reactive oxygen species. We speculated that cyclin D1 might have a novel non-cell-cycle function that protects the cancer cell from oxidative stress-induced senescence. However, the reputation of cyclin D1 as a cell cycle protein overshadowed the field and made several of our colleagues ignore the observation. Once we showed that inhibition of cyclin D1 in pRB-negative cells also promoted senescence, and that the anti-senescence role of cyclin D1 was independent of cyclin D1 kinase partner CDK4, people started to get excited about our results.

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

My 'eureka' moment was the time when I was trying very hard to find what triggered senescence in cyclin D1-depleted cells. With numerous hypotheses, I had to investigate many ideas and perform many more experiments. I eventually found that intracellular reactive oxygen was specifically and dramatically increased in cells undergoing senescence. The moment that I saw boxplots of the DCFDA fluorescent signals, which were clearly different between the responder and the non-responder cells, was the 'eureka!' moment for me. I felt like, 'Yes! I found a secret of this protein!'

Phatthamon Lapanuwat

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

We chose Journal of Cell Science because it's a journal that publishes works in our field and is known to be run by scientists. Journal of Cell Science is a high-quality journal and the review process is quick and reasonable. Importantly, there are no page charges. We see it as a venue where good science can be published without any influence of financial necessity. Every lab, big and small, has an equal chance, as long as the work is of high quality.

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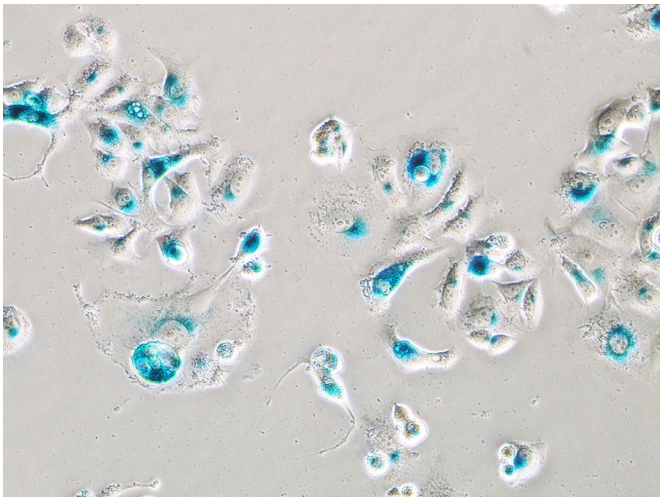
Journal of Cell Science (2018) 131, jcs221770. doi:10.1242/jcs.221770



Cellular senescence in Rb-negative cells upon cyclin D1 depletion.

Have you had any significant mentors who have helped you beyond supervision in the lab?

My significant mentor who always helps, guides and steers me in the right direction is my supervisor, Dr Siwanon Jirawatnotai. During my PhD studies, I have faced a lot of struggles that were sometimes challenging, often frustrating, but I always have his support. As he says, "I also learned from you, and we learned together from what you have found."

I also feel thankful to have generous colleagues like Drs Somponat Sampattavanich, Uraiwan Panich, Sarin Chimnaronk, Eric Lam, Seiji Okada and Peter Sicinski, who always give me insightful suggestions. Without them, this project couldn't have been finished.

"[…] learning about the nature of cancer is like learning about ourselves. Somewhere, the immortal life of the cancer cell may have hidden information for us to understand."

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?

When I first studied molecular biology, especially of cancer, I found it very difficult since things are always connected, with a lot of complexities within these connections. I felt it was very hard to understand all the dynamics, yet it was also very challenging. In addition, I found that learning about the nature of cancer is like learning about ourselves. Somewhere, the immortal life of the cancer cell may have hidden information for us to understand. It motivates me to learn more and more about it.

In Thailand, working as a scientist is not a dream job for most people, because it does not make a lot of money. However, when I had to make a decision whether I should go on with my pharmacy career or pursue a career in science, I did not hesitate to choose science. As a scientist, I believe that I will be able to understand my life better, and the knowledge that I uncover may be useful for people.

What's next for you?

I will never stop learning, as my ultimate goal is to find a way to treat cancer. I will go on with my research career as a postdoc. I am applying for a postdoc position in the field of cancer metabolism, hoping to gain a lot of experience and connections.

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

Because being a PhD student is tough; I always have to refresh myself and relieve my stress by doing something away from my bench, such as painting, travelling and taking pictures. I think arts and creativity are useful in science when you have to create something outside the box.

Reference

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