FIRST PERSON

First person – Nicole Myer

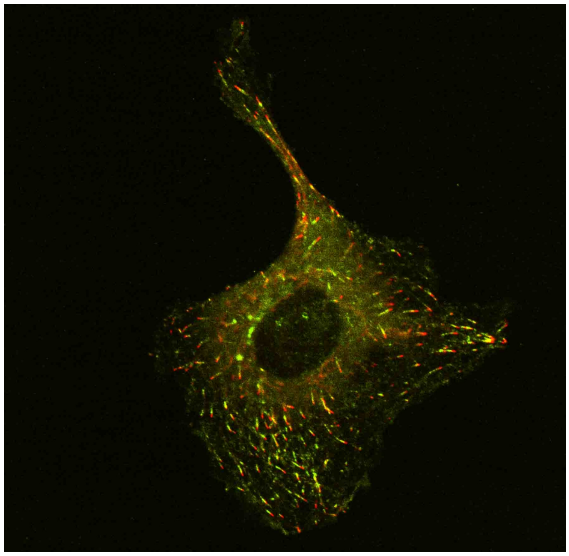
First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping early-career researchers promote themselves alongside their papers. Nicole Myer is first author on 'CLASP1 regulates endothelial cell branching morphology and directed migration', published in BiO. Nicole conducted the research in this article while a graduate research assistant in Kenneth Myers' lab at the University of the Sciences in Philadelphia, but is now Director of Clinical Research and Development at Genomind, investigating the intricacies of molecular biology and translating them into actionable information.

What is your scientific background and the general focus of your lab?

I have spent most of my research career elucidating regulatory pathways; first concentrating on transcriptional regulation of virulence factors in pathogenic microbes and subsequently, as a graduate student, focusing on patterns of angiogenic blood vessel development in chronic disease states like metastatic cancer. My laboratory is particularly interested in the protein regulation of dynamic microtubules and subsequent modulation of cellular branching and directional motility.

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

Tubes that form our veins and arteries (blood vessels) are made up of cells. Each of those cells have a skeleton that is similar to our bones.



GFP-CLASP1 (green) and mApple-EB3 (red) colocalization at microtubule plus-ends.

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Nicole Myer

Just like our bones allow us to take on different shapes and move – reaching an arm across the table to grab salt, or running, for example – the skeleton of our cells does the same thing. Other scientists have already shown that there are small proteins inside our cells that interact with cell's skeleton, so we used bright dyes to see these small proteins and the skeletons themselves under a fluorescent microscope. We found that these small proteins behave differently depending on what type of environment they are touching and that this has an effect on the ability of the cell to move. This becomes especially relevant for diseases like cancer because tumors need a blood supply to develop and metastasize. The cells that form blood vessels must take on different shapes and move in order to form new blood vessels to reach tumors. Understanding this process in more detail may support future drug development.

"[…] seeing the 'fruits of our labor' would not only be motivational and rewarding, it would promote more relevant, innovative research initiatives."

What are the potential implications of these results for your field of research?

On the biological research front this information is incredibly interesting and starts to crack away at the molecular basis of endothelial cell morphogenesis. Understanding that intracellular regulation of branching and directional migration is variably influenced by extracellular matrix mechanosensing begs additional questions: what happens in three-dimensional and/or physiologically relevant environments? How do chemical signaling cues interact with this physical regulatory system? On the clinical front this information is equally exciting. Successful anti-angiogenesis therapeutics like

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bevacizumab (Avastin) are being used alone and in combination with other drugs to treat metastatic colorectal cancer, renal cell cancer and some non-small cell lung cancers. These angiogenesis inhibitors prevent activation of vascular endothelial growth factor (VEGF) receptors and preclude the initiation of new blood vessel growth. Targeting physical modulators of angiogenesis offers an alternative therapeutic pathway that may supplement current treatments and/or circumvent clinically relevant resistance.

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

Graduate students and post-doctoral fellows often lack exposure to real-world applications of their scientific endeavors. It would behoove industrial institutions and universities alike if fellowship-style sponsorship were made available to junior scientists. Whether it be an intensive immersive excursion to a clinical setting in Western Africa to see the implementation of anti-infective practices and vaccines or a rotation within a research and development facility procuring novel pharmaceutical products, seeing the 'fruits of our labor' would not only be motivational and rewarding, it would promote more relevant, innovative research initiatives.

What's next for you?

I am currently and will continue to pursue career opportunities that will allow me to positively impact the next generation of female scientists through education and mentorship.

Reference

Myer, N. M. and Myers, K. A. (2017). CLASP1 regulates endothelial cell branching morphology and directed migration. *Biol. Open* **6**, doi:10.1242/bio.028571.