

FIRST PERSON

First person – Bibiana Franzen Matte

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. Bibiana Franzen Matte is first author on 'Matrix stiffness mechanically conditions EMT and migratory behavior of oral squamous cell carcinoma', published in JCS. Bibiana conducted the research described in this article while a PhD student in Adam Engler's lab at University of California San Diego. She is now a PhD student in the lab of Marcelo Lazzaron Lamers at Universidade Federal do Rio Grande, Brazil, investigating how the matrix environment can modulate tumor cell behavior.

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

Some tumors present as a stiff mass, for example, when a woman feels a stiff nodule during self-exam. Similarly, oral cancer also presents as a tumor with stiff margins. I wanted to know if this common clinical finding has a role during the process of cancer progression for oral tumors. I saw that the stiffness of the environment can affect cancer cells, both in highly invasive cancer cells and in less invasive ones that were programmed by their environment to become highly invasive. For example, I found that the less-invasive cell type did not show, at first, any differences in migratory behavior when on a soft or a stiff environment. However, when these cells were exposed to a stiff environment for longer periods, they started to express proteins related to a more-invasive cell type phenotype and also to migrate more. Accordingly, I observed in patient specimens that the higher collagen organization that correlates with tissue stiffness is associated with an early recurrence. Therefore, the stiff margins of oral cancer can 'help' the less-invasive cancer cells to adopt a more-invasive behavior.

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

In order to mimic the soft and stiff microenvironments, I plated the cells on polyacrylamide hydrogels of different stiffness. Therefore, all protocols to perform qRT-PCR, western blot or immunofluorescence had to be optimized in order to analyze cell phenotypes with this system.

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

That was the moment when we asked ourselves if cells could have a mechanical memory.

When I started analyzing the migratory behavior of cell lines with different invasiveness in soft and stiff microenvironments, I expected to observe a difference between soft and stiff in all cell lines. However, the less-invasive cell line had the same migratory pattern in both microenvironments. That was the moment when we



Bibiana Franzen Matte

asked ourselves if cells could have a mechanical memory. So, when the less-invasive cells were cultivated in a stiff matrix for longer periods of time and we did see modifications of their RNA and protein expression and also a higher migration velocity, we knew that this was something different and unexploited, and that was my 'eureka' moment.

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

As we believe that this paper can be interesting for researchers from different areas, Journal of Cell Science was our option since it has a broad audience and it publishes innovative findings from different areas.

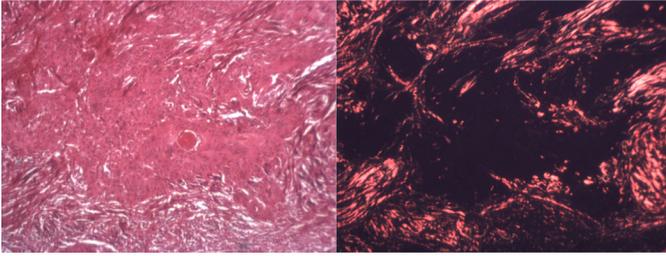
Have you had any significant mentors who have helped you beyond supervision in the lab? How was their guidance special?

I had two great mentors during this project. I have worked with Prof. Marcelo Lamers from UFRGS since 2010, and he has always encouraged me to pursue new goals and to think outside the box. He encouraged me to apply for a scholarship to do research in an international laboratory and to talk with Prof. Adam Engler from UCSD. When Prof. Engler accepted me to be part of his lab, even though he did not work with oral cancer, he gave me a big opportunity and a chance to learn. Therefore, I will always be grateful for both who taught me so much during my PhD.

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?

I graduated from Dental School and, even though I like the clinical practice in dentistry, I have always been passionate about research in the cancer field. I like to develop a project that can solve one question and make ten new questions. During Dental School, I went to University of Michigan (2012–2013) where I had my first contact with oral cancer research. After this experience, I could apply what I've learned in my lab in Brazil to continue my research. I'm doing the same thing right now after my experience at UCSD in 2017.

Bibiana Franzen Matte's contact details: Universidade Federal do Rio Grande, do Sul-Paulo Gama Avenue, 110-Farroupilha, 90040-060, Porto Alegre RS, Brazil. E-mail: bfmatte@gmail.com



Picrosirius Red stain of an island of invading cancer cells and its interaction with the extracellular matrix. On the left is a non-polarized light microscopy image of the cancer cell island. On the right, a polarized light microscopy image is shown highlighting the collagen organization surrounding the cancer cells.

What's next for you?

Research has become a great passion for me. As I'm finishing my PhD, I'm also working to continue to work in this area.

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

I like to run very early in the morning so I can start the day in the lab with a lot of energy!

Reference

Matte, B. F., Kumar, A., Placone, J. K., Zanella, V. G., Martins, M. D., Engler, A. J. and Lamers, M. L. (2019). Matrix stiffness mechanically conditions EMT and migratory behavior of oral squamous cell carcinoma. *J. Cell Sci.* **132**, jcs224360.