Western Faculty Profile: Dr. Silvia Penuela

Rebecca Lau¹

¹ Faculty of Science, Western University, London, Canada

No conflicts of interest declared

Educational Background

I am originally from Colombia where I obtained a BSc in Microbiology from the University of Los Andes in Bogota. From there, I travelled to the United States and attended the University of Minnesota. I completed my PhD in molecular genetics and plant pathology and shortly after, I pursued my first postdoctorate fellowship in the same university. I then moved with my husband and two kids to Canada where I did another postdoctorate in the Department of Cell Biology at Western University, but this time focusing on channel-forming proteins known as Pannexins. After about 5 years of postdoc, I transferred into a faculty position. As of July 2014, I have officially begun my position as tenure track faculty member here at Western. Since I am an early career faculty member, I only teach one course a year as well as few guest lectures. Most of my time is spent in the lab as well as working on presentations and papers.

What made you choose Western University among other academic institutions?

Here at Western University I was able to find many suitable labs to pursue research in cancer and cell biology. Likewise, Western is extremely reputable for biomedical research and this was where my husband did his fellowship and research here as well.

Could you tell us about the research you have done in the past as well as the research your lab is currently interested in?

Well I would say my research has definitely taken quite a turn and that flexibility and variety is something we all come across in the field of science! Back when I was doing my PhD in the molecular biology of plants, I was actually studying soybeans and discovered channels that functioned in plant cell defence – mainly by recognizing pathogens and different pests that attack plants. Really, it was like studying the immune system but of plants!

When I started my postdoc, I studied mammalian cells, specifically a new family of proteins known as Pannexins. At the time, not too much was known about these channel proteins and we worked on developing antibodies, tools and other constructs to explore the basic biochemistry and cell biology of Pannexins. What we discovered was that these channel proteins were used for long distance communication, similar to cell phones and text messages as opposed to cell-to-cell or face-to-face communication. These proteins release ATP and metabolites to communicate with other cells “down the road” in the same tissue, triggering growth or increased differentiation.

My main area of research is with cancer, especially melanoma, glioblastoma and the role of these Pannexin channels in cancer. We think that Pannexins are upregulated or highly expressed in cancer cells; just like how a teenager and in this case, melanoma cells, send too many text messages. These messages in turn, is what makes a tumour grow or causes cancer cells to metastasize into a distant organ. Another area of research we are interested in is the role of Pannexin in obesity and inflammation. Using mouse models, we can observe that when we remove one or more Pannexin channels, mice accumulate more fat. In these two areas, we are still exploring the physiological aspects of Pannexin with respect to health and disease.

In your opinion, what are some qualities that you look for in a research student?

When I interview applicants, two things that I always look for is character and drive. It's a pleasure to see students with a strong work ethic, discipline, and definitely not being shy to work hard in a field of research that they are passionate about. You can train a teachable student all the techniques available and show them the ropes but at the end of the day, it really makes a difference when they are both highly motivated and excited about research. In fact, we strive to establish that kind of atmosphere in the lab, by balancing working many hours in the lab with conferences to discuss and share research abroad. Indeed, as many say, research can grow to be more fun than just work!

What advice would you give to undergraduate students interested in getting involved in research?

Don't be shy or ever hesitate to approach people in the lab, whether it is a professor, lab technician, or research analyst. I would definitely encourage those interested in research to try to obtain a volunteer position, do a fourth-year thesis or summer project in a lab. And when it comes to contacting, I would recommend students to do some research and investigation into the research areas that the lab is focusing on. Spending the time to send a thoughtful and relevant email definitely catches attention as opposed to sending a generic one. Getting involved in research earlier is extremely beneficial too because it provides the opportunity for students to explore and discover if they are passionate in the field of science. On the other hand, research experience plays a huge role in building your profile and expanding your network with scientists.

To read more about Dr. Penuela's research and her lab, please visit her website:

http://www.schulich.uwo.ca/anatomy/people/bios/faculty/penuela_silvia%20.html