



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

## Department of Cellular and Physiological Sciences



### **Andrea Wills, Ph.D**

**Assistant Professor of Biochemistry**

**University of Washington**

**\*\*CPS SEMINAR TIME\*\***

**12:30 PM Thursday, Feb. 7, 2019**

**Location: LSC3**

**Hosted by Drs. Rideout and Kopp**

### **"Remodeling chromatin and transcription during vertebrate regeneration"**

**In contrast to humans, many vertebrate species are able to fully regenerate lost limbs or damaged spinal cords after injury. A particularly valuable model for this complex tissue regeneration is the frog *Xenopus tropicalis*, which can fully regenerate lost appendages as a tadpole but loses this ability as an adult. Many early embryonic signaling pathways are now known to contribute to the regenerative process, but the fundamental molecular mechanisms that enable or constrain regenerative competence are not well defined. To understand how regeneration is initiated, my group uses an integrative genomics approach, applying RNA-Seq and ATAC-Seq to identify the domains of chromatin that gain or lose accessibility after injury and how these changes are coupled to transcriptional dynamics. A particular goal is to understand how tissue-specific progenitor cells respond to injury, and how the competing tissue needs of self-renewal and differentiation are addressed in a regenerative context. In my talk I will share new data suggesting that distinct transcriptional regulatory programs drive phases of differentiation and proliferation in regenerating neural progenitors. I will also introduce a unique nuclear morphology in *Xenopus* tail cells that is dynamically remodeled in the early hours of regeneration.**

**Join us for coffee and cookies at Noon in LSC 1416!!!**

For more information please contact Dr.Rideout<[elizabeth.rideout@ubc.ca](mailto:elizabeth.rideout@ubc.ca)>, Dr.Kopp<[janel.kopp@ubc.ca](mailto:janel.kopp@ubc.ca)>

## **CPS Seminar Series 2018/19 - Student Interview**

External speaker: Dr. Andrea Wills

Date: February 7th, 2019

Student host: Soheila Zarei

### **1. Describe your career path, what led you to this area of research in particular?**

In my undergrad, I went to a smaller college and worked on a hydra regeneration project for 2 years. Then in grad school I worked on early embryonic envelopment. At the time when I was finishing graduate school, next generation sequencing came out and it was a very hot topic. As a result, I went to a Department of Genetics that was very big on sequencing for my post-doc. There I learned a lot about sequencing, ChIP-Seq, and computational skills, anticipating these would be useful techniques wherever I went in the future. I would say that since you never know what you will do in the future, the more skills you have, the better prepared you will be. At your postdoc, you have to develop a vision of what you are going to do in your own lab, so you have to start working on something new not to compete with your post-doc lab. I was lucky to have a very supportive and encouraging boss, so I thought it might be cool to compare the mechanisms of embryogenesis and regeneration with respect to enhancers and how they interact with transcription factors. My post-doc supervisor gave me the go ahead to do this, and the first thing that I did was an RNA-seq time course during regeneration in 2013. When ATAC-seq came out we tried that as well in other cell types, and then in frogs and it worked really well!

### **2. Were there specific moments in your training that were essential for your future career? Can you identify a factor that was really important for your success?**

I would say I never had a paper in Nature or Science, but I did well in the job market for a couple of reasons. First, I had several papers that reflected work I had done on different projects. This came out of my tendency to hedge my bets by working on a couple projects at the same time, so if one didn't work I still had other projects to work on. Second, I developed a good network by going to every conference that I could go to, and tried to give as many talks as I could. Although this is a difficult task if you are a shy person, it is very important to go out and develop your communication skills, because that is how people will recognize your name and remember you. As a trainee, it's important to practice your communication skills by giving different talks and developing confidence in your presenting style. By the time I went on the job market, there were many people who could recognize me, and I think that was something that helped me in getting a position. So take advantage of every student seminar opportunity! In fact, I send all of my students to many conferences as I can, as I believe it's very helpful for all of us. It keeps you fresh and up-to-date in the field, and will get you some feedback from established scientists in the field.

### **3. What are some challenges you see new trainees face and what advice would you offer?**

Grad school takes a very long time and it can't be great all the time, so it's easy to go through a few months with something not working very well and get discouraged. So if you have more than one project going, then if one project isn't working, the other one might be ok, making it easier to cope. Also, I think work-life balance is important, and something that can help you de-stress. Making sure that the side projects that you start are going somewhere is one of the other things that you should consider—if you're putting time into something, even if it's intended as a creative outlet, make sure it has the potential to be useful.

#### **4. What was your best experience as a trainee?**

I had a super great lab as a grad student, just the people, really awesome, and very fun to hang out with, and they were really engaged with science. My supervisor was a great person too, but he also had outstanding trainees in the lab. As a result our lab environment was very academically stimulating to be in.

#### **5. What was your worst experience as a trainee?**

I worked for a while on stem cells as a postdoc, and somewhat to my surprise I really disliked it. Luckily, another project working with frogs came along and my PI supported my transition back to animal work. Also, the project that I wrote my thesis proposal on didn't work at all. I spent two and a half years on it and it was never published.

Eventually, I let that project go, but thankfully I had other stuff to work on. One thing I learned as a coping tool was to set aside the stuff you don't like to do for a week or two and then come back later. I still love sorting embryos, so when I get tired of writing grants or bureaucratic tasks like animal use protocols I ask my students if they want me to do embryo sorting for them which refreshes me and then helps me come back to writing!

#### **6. What part of your job today did graduate school not prepare you for?**

The ins and outs of managing trainees on a day-to-day basis was something that I was not prepared for. For example, it can be difficult to "be the boss" and press my students to do certain tasks. Also, conflict between trainees is very hard as I want to be on everyone's side. Since it's so important to keep a group of people engaged in research, I try to be very present in the lab to monitor the interactions, and to keep up a positive research environment. I am better at this in some quarters than others, and I think that the quarters where I'm more present in lab it makes a noticeable difference. So in preparation for this side of the job, it is important to do as much mentoring as you can while you are a trainee.