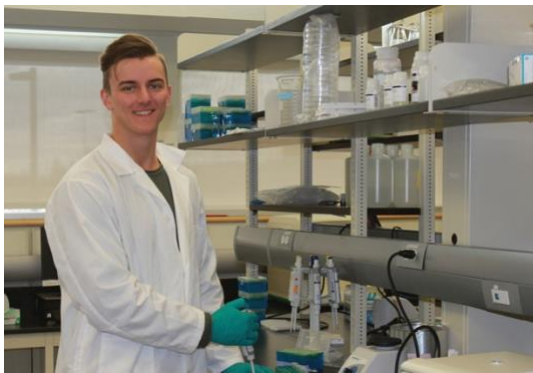




For immediate release — November 7, 2018

## Undergrad scores big with research poster

As an undergraduate student researcher, Justin Miller was simply excited to be attending the Canadian Ecotoxicity Workshop recently held in Vancouver. As Canada's predominant annual conference for ecotoxicologists, he knew he'd be learning about the latest developments in the field. What he didn't expect was to come away with a third-place award and a cash prize for his research poster.



"I was one of the only, if not the only, undergrad there," he says. "That was cool in and of itself and then to take home an award was a complete honour. I couldn't believe it and I still can't, to tell you the truth."

"This workshop is the largest and most important annual meeting of ecotoxicologists in Canada and it's very rare that an undergraduate student wins one of these awards," says Dr. Steve Wiseman, a U of L biology professor and Miller's supervisor. "The award speaks volumes about the quality of Justin's work and the U of L's strong commitment to undergraduate research."

Miller's poster was built around the research he conducted in Wiseman's lab during the summer, thanks to an Undergraduate Student Research Award from the Natural Sciences and Engineering Research Council (NSERC). He investigated the effects of a commonly used herbicide in Canada on fish.

"The research I did over the summer was using rainbow trout raised in the lab," says Miller. "I wanted to see how fish exposed to dicamba, an herbicide used to kill broadleaf weeds, would be affected. The main process I looked at was oxidative stress. The primary spot where these chemicals would be found is in the liver, as that's where they're processed."

Oxidative stress occurs when an imbalance exists between anti-oxidants and pro-oxidants, something that can occur with exposure to environmental chemicals. Too many pro-oxidants can damage structures within the cell and can result in a variety of physiological impairments.

“What I found is that oxidative stress is not a mechanism of toxicity induced by dicamba but I did find there was a change in the methyl pool, specifically an increase in methyl groups, and I’m investigating that further,” says Miller.

He also looked at DNA methylation in his fish subjects. Methyl groups attached to DNA are important for regulation of gene expression. So far, Miller hasn’t found much in terms of effects of dicamba on DNA methylation but he’s waiting on more data. He also intends to explore whether any changes in DNA methylation caused by exposure to dicamba get passed on to future generations in upcoming research.

Miller, from Cranbrook, British Columbia, started his post-secondary studies at the College of the Rockies in a university transfer program after taking a year after high school to play junior hockey with the Columbia Valley Rockies and the Summerland Steam. Thanks to the college’s dual admission program with the U of L, Miller was able to complete his first two years in Cranbrook.

“Pretty much since I was a kid, I’ve wanted to be a doctor,” he says. “I still want to be one and I’m working every day to do that. Everything I do is pretty much centred around that goal.”

As a youngster, Miller remembers helping his mother study when she was taking a medical transcriptionist course. He read her flashcards and was intrigued to learn the meaning of the words. Throughout his post-secondary schooling, he’s kept his grades up while getting involved in all kinds of activities.

“I do a lot of coaching; I’m a goalie coach and I run a goaltending clinic in Taber every week,” he says. “I’m involved in the U of L Pre-Med club and I also volunteer at the hospital in a leader rounding support position. I really enjoy that. It’s such an incredible experience and I’m really lucky to be doing it. I’m grateful I was chosen for that position.”

In this role, Miller talks to patients about the care they received, their future goals with their care and what kinds of supports they might need at home. As the medical representative on the Pre-Med Club, he’s organized events to help members learn about the admission process and held MCAT study sessions. One such event is the club’s Hoof-It Run, a fundraiser for the Students’ Union food bank, scheduled for March.

Miller is currently working on his undergraduate honour’s thesis, with plans to start a master’s program with Wiseman next spring and apply to medical school next summer.

This news release can be found online at [Justin Miller](#).

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