



## ANNOUNCEMENT

Interested Members of the University community are invited to attend the Final Oral Examination for the degree of **Master of Science** of

### *Stefanie Bradley*

of the Department of Biomedical Sciences (Ontario Veterinary College) on Friday, November 30<sup>th</sup> at 2:45pm in Pathobiology Room 1812 (Seminar); and Pathobiology Room 3826 (Examination).

### *Nervous System Compensation Following Tail Loss and Regeneration in the Leopard Gecko (*Eublepharis macularius*)*

#### Examination Committee

Dr. Matthew Vickaryous, Advisor

Dr. Craig Bailey, Committee Member

Dr. Neil MacLusky, Graduate Faculty

Dr. Jonathon LaMarre, Exam Chair

#### Advisory Committee

Dr. Matthew Vickaryous

Dr. Craig Bailey

Dr. Leah Bent

## ABSTRACT

Mass change is a physical phenomenon with important implications for biomechanics and locomotion. Here, we used the leopard gecko (*Eublepharis macularius*) to investigate the effect of a drastic change in mass following tail loss (autotomy), and subsequent regeneration of the tail. We assessed two components of the nervous system: tactile sensitivity, and Purkinje cell neuromorphology. Using Semmes-Weinstein monofilaments, we found regional differences in tactile sensitivity prior to autotomy. Following tail autotomy, the hindlimbs became significantly more sensitive, while the forelimbs did not. Golgi-Cox staining of Purkinje cells showed that tail autotomy had no significant effect on Purkinje cell structure. However, after 30 days of tail regeneration, there was evidence of dendritic remodeling corresponding to the parallel-fiber-Purkinje cell synapse. Together, these data provide support for short-term (transient) compensation of the peripheral nervous system, and long-term compensation of the central nervous system, in geckos following autotomy.

## PRESENTATIONS (\* denotes presenter)

**Bradley, S.\*** Bailey, C.D.C. and Vickaryous M. Towards a structural characterization of the leopard gecko cerebellum: Purkinje cells and cells of the external granular layer. Experimental Biology Conference 2018, San Diego, United States.

McDonald, R., **Bradley, S.** and Vickaryous, M. Distribution of Neural/Stem Progenitor Cells in the Brain of the Leopard Gecko (*Eublepharis macularius*). (Poster presentation). Experimental Biology Conference 2017, Chicago, United States.

**Bradley, S.\***, Dick, M.F., Guglielmo, C.G. and Timoshenko A. Seasonal and flight-related variation of galectin expression in heart, liver and flight muscles of yellow-rumped warblers (*Setophaga coronata*). Canadian Society of Zoologists Conference 2016, London, Canada.

## PUBLICATIONS

**Bradley, S.**, Dick, M.F., Guglielmo, C.G., Timoshenko, A. (2017). Seasonal and flight-related variation of galectin expression in heart, liver, and flight muscles of yellow-rumped warblers (*Setophaga coronata*). Glycoconjugate Journal. 34: 603-611.

## BIOGRAPHICAL DATA

Stefanie attended Western University for her undergraduate degree in biology and medical science. She first got involved in research through an undergraduate research project and work-study position at Western University in the labs of Dr. Timoshenko (molecular biology) and Dr. Guglielmo (avian physiology). She later worked as a laboratory technician in a veterinary diagnostic laboratory, Antech Diagnostics. Stefanie continued to pursue research at the University of Guelph, in the Vickaryous lab as an MSc student.

## AWARDS RECEIVED

Ontario Graduate Scholarship (Doctoral)	2018
Roland A.W. Scott Memorial Scholarship	2018
Harry G. Downie Travel Grant	2018

**Department of Biomedical Sciences**  
Ontario Veterinary College  
University of Guelph  
50 Stone Road East  
Guelph, Ontario, Canada N1G 2W1  
T 519-824-4120  
[ovc.uoguelph.ca/biomedical-sciences](http://ovc.uoguelph.ca/biomedical-sciences)

**IMPROVE LIFE.**