



COLLEGE of  
BIOLOGICAL SCIENCE

DEPARTMENT OF MOLECULAR  
AND CELLULAR BIOLOGY

**Announcement:**

All interested members of the university community are invited to attend the Final Oral Examination for the degree of **Master of Science** of

**LILIANNE GEE**

**On Thursday, February 10, 2022 at 9:30 a.m.** (online)

**Thesis Title:** Functional characterization of *Andropogon gerardii* (big bluestem) fungal endophytes and their relationship with *Panicum virgatum* (switchgrass)

**Examination Committee:**

Dr. John Vessey, Dept. of Molecular and Cellular Biology (Exam Chair)  
Dr. Jennifer Geddes-McAlister, Dept. of Molecular and Cellular Biology  
Dr. Manish Raizada, Dept. of Plant Agriculture  
Dr. George van der Merwe, Dept. of Molecular and Cellular Biology

**Advisory Committee:**

Dr. Jennifer Geddes-McAlister  
(Co-Advisor)  
Dr. Jonathan Newman  
(Co-Advisor)

**Abstract:** Co-evolution between the soil microbial community and plants, has led to some microorganisms becoming incorporated within plant tissues, known as endophytes. Seed-borne endophytes are unique, as this point of the life-cycle represents the beginning of a life-long relationship between symbiotic partners. In this Thesis, I investigate whether fungal endophytes belonging to one host species can be transferred for the benefit of another host species in the same family. More than 400 fungal endophyte strains were isolated from seeds that were harvested from 24 *Andropogon gerardii* plants grown in a low-input system. Beneficial properties were screened for 110 morphotypes to select candidates for further characterization and greenhouse growth experiments in *Panicum virgatum*. It was found that individual endophytes can influence the biomass of a plant, and additionally, proteome analysis revealed a variety of proteins that may provide pathways for endophyte-plant interactions. Overall, an understanding of endophytic symbioses may provide insight to their complex adaptability with plants.

**Curriculum Vitae:** Lilianne completed her BSc (Hons.) in Biochemistry with a minor of Microbiology at the University of Guelph in Winter 2018. She began her MSc of Molecular and Cellular Biology in the lab of Dr. Geddes-McAlister in Fall 2019.