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

MARITZA VATTA
On Thursday, May 9, 2019 at 9:30 a.m. in SSC 2315

Thesis Title: Application of plant extracts as antimicrobials against *Streptomyces scabies* and characterization of the DNA-binding motif in Scabin toxin

Examination Committee:
Dr. R. Lu, Dept. of Molecular and Cellular Biology (Exam Chair)
Dr. R. Merrill, Dept. of Molecular and Cellular Biology
Dr. T. Akhtar, Dept. of Molecular and Cellular Biology
Dr. I. Tetlow, Dept. of Molecular and Cellular Biology

Advisory Committee:
Dr. R. Merrill (Adv)
Dr. T. Akhtar
Dr. J. Mathur

Abstract: The common scab disease, caused by *Streptomyces* species, is characterized by lesions on tuber crops which causes multi-million dollar annual losses in the potato industry alone. A total of 54 plant tinctures were tested for antimicrobial activity against *S. scabies*. The best plant tinctures for growth inhibition, myrrh and garlic, showed complete cessation of growth in culture for all four *Streptomyces* strains (S. *scabies*, S. *turgidiscabies*, S. *acidiscabies*, and S. *europaeiscabiei*). A mono-ADP-ribosyltransferase (mART) toxin from *S. scabies*, is termed Scabin. mART toxins are released by pathogenic bacteria as virulence factors that transfer the ADP-ribose group of NAD⁺ to a target macromolecule. Characterization of the role of several DNA-binding residues in Scabin was completed to understand the catalytic signature of the enzyme. The corresponding variants were analyzed for enzymatic activity as well as their binding affinity for a dsDNA substrate. It was shown that Tyr129 is an important residue within the Scabin DNA-binding motif that controls substrate binding.

Curriculum Vitae: Maritza obtained her Bachelor of Science (Hons.), Biochemistry Co-op, at the University of Guelph in December 2016, and then began her M.Sc. in the lab of Dr. Rod Merrill in May 2017.
