

Department of Molecular and Cellular
Biology

Graduate Seminar MCB*6500

Friday, January 26, 2024 @12:00 p.m.

presented by:

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"Molecular gene drive for the population management of invasive *Sus scrofa*"

Invasive species in non-native ecosystems endanger the integrity and viability of their surrounding environment. A species of great concern is *Sus scrofa*, or the Eurasian wild boar, recognized as one of the most invasive mammals in the world. Their ruination of agricultural land via destructive eating habits, their ability to transmit diseases to both humans and livestock (i.e., African Swine Fever), as well as their adaptiveness and aggressive nature, have raised concern in the Canadian agricultural, forestry, and healthcare industries. Traditional invasive species eradication methods such as trapping and hunting have been proven minimally effective due to the flexibility of *S. scrofa* to adapt to various environmental conditions. Thus, consideration and implementation of innovative methods of species eradication must be studied. Proposing the development and utilization of the molecular tool known as gene drive, we aim to discover an effective solution for the management of invasive *S. scrofa* populations throughout Canada and beyond. Gene drive is a gene editing system that makes use of the clustered regularly interspaced palindromic repeats/CRISPR-associated protein (CRISPR/Cas) system using an engineered single-guided RNA to direct the system to its targeted genomic location. By targeting a sex-specific reproductive gene, the reproductive capacity of affected individuals would be modified, decreasing the rate of species expansion. A gene drive cassette will be designed to target a female *S. scrofa* fertility gene. By examining the modified system in porcine fibroblasts from an individual indicative of the wild population, we can evaluate the efficiency of this eradication method. This research holds value in developing an understanding of gene drives in mammalian species and offers the potential of implementing gene drives as population control measures to help eradicate issues posed by *S. scrofa* in Canada.

