

Department of Molecular and Cellular Biology
Graduate Seminar MCB*6500

Friday, Sept. 29, 2017 in SSC 2315@ 12 noon

presented by:



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(Advisor: L. Mutharia)

"Population Structure Studies of *Flavobacterium branchiophilum* Strains from Ontario, Canada"

Flavobacterium branchiophilum is a Gram-negative, filamentous rod which causes bacterial gill disease (BGD). BGD predominantly affects freshwater juvenile hatchery-bred salmonids and is characterized by large numbers of the bacterium associated with the gill epithelium, affecting oxygen exchange. BGD has become a significant production-limiting factor in Ontario aquaculture and chemical treatments (e.g. chloramine-T) are mainly used to control mortality. *Flavobacterium psychrophilum* and *F. columnare* are two well-studied and easily cultured fish pathogens. Contrastingly, difficulties with culture, isolation and stability of freezer stocks have limited *F. branchiophilum* research. Therefore, little is known about environmental reservoirs, intraspecies diversity and pathogenic mechanisms. The Fish Health Laboratory (MCB Department), using an in-house modified media for culture and cryopreservation, has gathered a collection of *F. branchiophilum* isolates from different years of isolation, fish species and hatcheries across Ontario. These will be the subjects of my M.Sc. thesis research to test the hypothesis that strains of *F. branchiophilum* circulating in Ontario are phenotypically and genotypically diverse. Since little is known about the population structure, the outer membrane proteins and lipopolysaccharide profiles will be investigated to characterize serotypes. Comparative analyses of the secretomes (secreted proteins) of the American Type Culture Collection (ATCC) 35035^T strain and at least one Ontario disease-associated *F. branchiophilum* found to have different serotypic profiles, will be examined. These experiments will provide a rationale for subsequent genome sequencing and studies on population structure. The research will offer a starting point for understanding the pathogenesis of *F. branchiophilum* and development of diagnostic tools for prevention of BGD outbreaks.