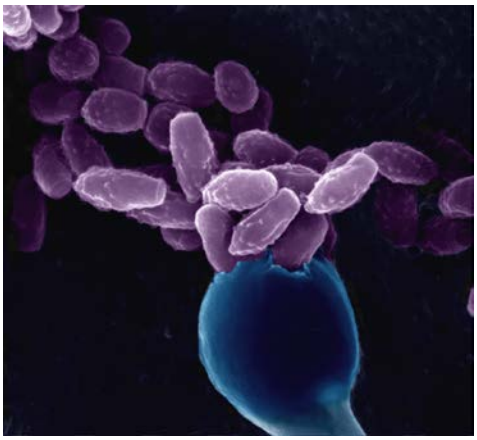
GUEST SPEAKER SEMINAR

Molecular Genetics
UNIVERSITY OF TORONTO

Sexual reproduction and the evolution of eukaryotic microbial pathogens



We study the evolution of sexual reproduction and its impact on microbial pathogens. Many fungi and parasites were thought asexual and clonal; we now appreciate the majority have extant unusual sexual cycles. We study how sexual identity is specified by mating-type loci. In parallel we study how sexual reproduction occurs. We discovered an unusual sexual cycle involving only one mating-type, unisexual reproduction, that provides adaptive benefits. First, unisex generates genetic diversity de novo, preserving well-adapted genomic configurations yet generating limited genetic diversity. Second, unisex promotes yeast-filamentous transition to forage for nutrients and generate infectious spores. Third, unisex reverses Muller's Ratchet, avoiding mutation accumulation that dooms asexual species to extinction. Other fungi and eukaryotic parasites reproduce unisexually. Unisex may have evolved to mitigate sex-associated costs and afford advantages associated with conventional sexual modes. Studies of fungal sex evolution illustrate general principles with implications for model and pathogenic microbes and multicellular eukaryotes, and provide insight into an evolutionary epoche with sex before sexes

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Date: Monday November 9th, 2015
Time: 4PM
Place: FitzGerald Building
150 College Street
Room 103