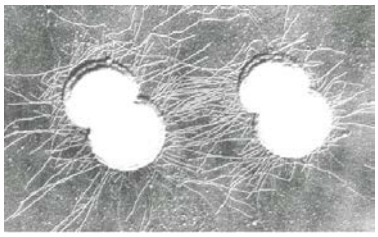
GUEST SPEAKER SEMINAR

Molecular Genetics
UNIVERSITY OF TORONTO

# How does diversification allow for important functions? – Lessons from the mechanisms and results of pilus antigenic variation in *Neisseria gonorrhoeae*



The type IV pilus is a major virulence factor of Neisseria gonorrhoeae (Gc) and is established as a critical determinant for adherence, motility, and genetic transfer. The Gc pilus undergoes high frequency phase and antigenic variation through a variety of mechanisms and we have established that the gene conversion reactions that underlie the process of antigenic variation relies on the formation of a guanine quadruplex DNA structure that depends on transcription to form and initiate recombination. In addition, we have demonstrated that pilus-mediated motility and adherence to epithelial cells is modulated by interactions between components of seminal plasma (semen without insoluble material) and the Gc pilus. We have defined molecules responsible for this alteration of pilus function, probed the molecular basis of the binding to the pilus and have also shown an effect of these substances on Gc biofilm formation. Additionally, production of a functional Gc pilus requires the peptidoglycan-reactive, zinc-metalloprotease, Mpg, and pilus expression is required for the resistance to oxidative and non-oxidative killing mechanisms of PMNs. We are examining the mechanistic basis for the role of Mpg in pilus expression as well as pilus-dependent resistance to PMN killing. These studies expand our understanding of type IV pilus function in the context of host interactions provides to Gc, and show that environmental factors influence pilus function and pathogenesis

## Dr. Hank Seifert

John Edward Porter Professor of Biomedical Research
**Northwestern University**

Host: Dr. Scott Gray-Owen

**Date:** Monday September 22nd, 2014
**Time:** 4PM
**Place:** Fitzgerald Building, 150 College Street, Room 103