

Department of Molecular and Cellular Biology

Graduate Seminar MCB*6500

Friday, May 26, 2023 @12:00 p.m.

presented by:

Joyce Kuipers

(Advisor: Dr. Cezar Khursigara)

"Role of biofilms in *Neisseria gonorrhoeae* infections and antimicrobial resistance"

Neisseria gonorrhoeae is the etiological agent of the sexually transmitted infection gonorrhea. Over the past few decades, there has been an increase in antimicrobial resistance (AMR) seen in the pathogen. This has led to an arms race in understanding AMR mechanisms and development of new therapies. However, there are significant gaps in knowledge in understanding disease pathogenesis, particularly the role of gonococcal biofilms. With the high prevalence of asymptomatic infections, it is theorized that they are mediated by biofilms. Considering there is a lack of knowledge on the role of biofilms, this project aims to characterize AMR in the context of gonococcal biofilms using phenotypic assays and proteomics. First, phenotypic assays including antimicrobial susceptibilities will be performed to gain a baseline understanding of how biofilms adapt to the presence of challenges within their environment. Second, a bottom-up proteomic approach will be used to elucidate changes in relative protein abundances to identify key proteins involved in these responses for further investigation. Finally, several microscopic methods will be utilized to elucidate changes to the overall structure of the biofilm, particularly the extrapolymeric substances (EPS), when exposed to environmental challenges. The goal of this research is to establish a foundational understanding of gonococcal biofilm development and response to stressors, including antimicrobials, to elucidate novel mechanisms in AMR in the context of biofilms.