

# Interdisciplinary Center for the Study of Biocomplexity Colloquium

**John Dutcher**

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University of Guelph

will give a lecture entitled:

*Effect of Antimicrobial Agents on MinD Protein Oscillations in E. coli Bacterial Cells*

## Abstract

Biological systems have many intricate structures and mechanisms that are truly fascinating examples of Nature's nanotechnology. A casual look through the classic textbook "Molecular Biology of the Cell" provides many examples that inspire much of the current efforts in biological physics or quantitative biology. One striking example is the self-assembly of a variety of proteins within bacterial cells that control cell division, both spatially and temporally. In the rod-shaped bacterium *Escherichia coli*, an important part of the cell division process is the oscillation of Min proteins along the major axis of the cell. This system has been the focus of much experimental and theoretical work during the past decade, since it can be studied using fluorescence microscopy by tagging the Min system with fluorescent proteins, and using simplified reaction-diffusion models that can reproduce many aspects of the system dynamics. In our experiments, we use a strain of *E. coli* in which the MinD proteins are tagged with green fluorescent protein (GFP), allowing fluorescence visualization of the MinD oscillation. We use high-resolution total internal reflection fluorescence (TIRF) microscopy and a custom, temperature controlled flow cell to observe the effect of exposure to antimicrobial agents on the MinD oscillation period and, more generally, to analyze the time variation of the spatial distribution of the MinD proteins within the cells. These measurements provide insight into the mechanism of antimicrobial action.



**Friday, November 2, 2012**  
**4:00 p.m. to 5:00 p.m.**  
**127 Hayes-Healy Center**