



# Genome Sciences Seminar

Wednesday, 12.7.16 | 3:30 | Foege Auditorium

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## Dr. Michael Elowitz

Professor of Biology, Bioengineering and Applied Physics; Bren Scholar; Caltech

Investigator, Howard Hughes Medical Institute

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## "The design of mammalian communication and memory systems"

### student-invited speaker

#### Elowitz Lab:

Genetic circuits, composed of interacting genes and proteins, enable individual cells to respond to signals and environmental conditions, make decisions, and communicate with one another. What are the key design principles of genetic circuits? And, how do these circuits function dynamically in individual cells and multicellular systems? To address these questions, we develop and use several experimental approaches. We build our own synthetic genetic circuits and study their functions in bacteria, yeast, and mammalian cells. These synthetic circuits are simpler counterparts to the complex circuits one finds in nature. This approach is often called "synthetic biology."

We make time-lapse movies to quantitatively observe dynamics of natural and synthetic genetic circuits in individual cells. These experiments take advantage of multiple fluorescent proteins to observe several parts of a circuit simultaneously in the same cell.

We study variability within cell populations, to understand how genetic circuits generate variability, through stochastic fluctuations, or "noise," how they use this variability (for differentiation and evolution), and how they operate reliably in spite of variability.

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Refreshments served outside the Auditorium at 3:20pm

Questions? Contact Brian Giebel at [bgiebel@uw.edu](mailto:bgiebel@uw.edu) or visit the Seminar website at <http://www.gs.washington.edu/news/seminars.htm>

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