# BIOENGINEERING & BIOMEDICAL ENGINEERING RESEARCH SEMINAR

## MULTISCALE COMPUTATION OF STOCHASTIC NETWORK, CHROMATIN FOLDING, & TISSUE FORMATION FOR UNDERSTANDING CELLULAR EPIGENETIC STATES & WOUND HEALING

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Genome sequences provide the overall genetic blueprint of cells, but cells possessing the same genome can exhibit diverse phenotypes. There is a multitude of mechanisms controlling cellular epigenetic states and that dictate the behavior of cells. Among these, motifs of networks of interacting molecules, often under stochastic control, can exhibit different landscapes of phenotypic states. In addition, chromosome folding in three-dimensional space provides another important control mechanism for selective activation and repression of gene expression. Fully differentiated cells with different properties grow, divide, and interact through mechanical forces and communicate through signal transduction, resulting in the formation of complex tissue patterns that are important for wound healing. We discuss recent results of theoretical models, algorithms, and computational tools for studying these multi-scale problems.

**February 3, 2017**
**MD 267**
**1:00PM**

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BME