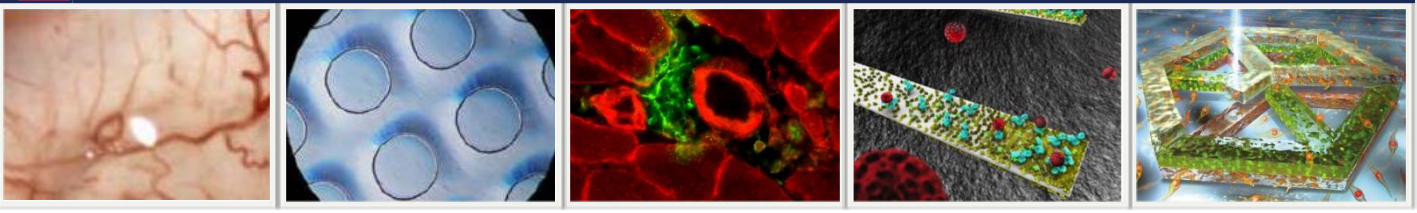
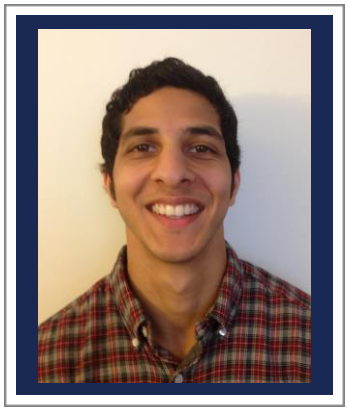
BioNanotechnology Seminar Series

Fall 2014





Role of Lamin A/C in Nuclear Organization

Rishi Singh, CMMB IGERT Trainee

Rishi is a PhD student in Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign

Date: **Wednesday, October 29, 2014**
Time: **12:30 – 1:00 p.m. Central (10:30 – 11:00 a.m. Pacific)**
Location: **1000 MNTL at Illinois (KL 361 at UC Merced)**

Abstract:

The nuclear lamina is a thin network of lamin proteins which lines the inner nuclear membrane, giving it structural integrity and providing anchoring points for several DNA-binding and transmembrane proteins. While many of these proteins and their functions are being studied, not much is known about how the lamina in particular affects cell behavior and gene activity. The aim of this is to investigate the specific roles of lamin A/C in nuclear shape, heterochromatin and chromosome organization, and then study how these changes affect genomic activity. Lamin A/C knockdown and human lamin A/C knock-in mouse embryonic fibroblasts were used to isolate the role of lamin A/C, and patterned substrates were used to modulate cell shape and cytoskeletal contractility. Lamin A/C is shown to affect heterochromatin organization independent of cytoskeletal contractility and nuclear shape, as lack of lamin A/C decreased the total number of heterochromatin nodes and increased average node volume regardless of cell shape. Through chromosome painting, lamin A/C was shown to differentially affect the positioning and shape of chromosome 5 and 9, indicating that certain genes and regions of DNA are more sensitive to mechanical and geometric perturbations than others.

Seminar Presented by:

Center for Cellular Mechanics
University of Illinois at Urbana-Champaign

IGERT Integrative Graduate Education and Research Traineeship
Cellular and Molecular Mechanics and BioNanotechnology

M-CNTC NCI Alliance for Nanotechnology in Cancer
Midwest Cancer Nanotechnology Training Center

CNST University of Illinois Center for Nanoscale Science and Technology