



Research In Progress Seminar

**Tuesday, March 14,
2017
2:00PM**

**Location: The Fishbowl,
2120 Biological Sciences 3**

Speakers:

Kathryn Manakova &
Mehrsa Mehrabi,
Mathematics &
Biomedical Engineering

Talk Title:

Nuclear blebbing and
lamin-mediated defects in
cardiomyopathies

Abstract:

Cardiomyopathies and arrhythmia are conditions with high morbidity and limited therapies. Although a vast number of genes have been discovered to contribute to the etiology of these diseases, translational research—the practical application of genetic knowledge to improve screening, diagnosis, and treatment for affected individuals and their families—has been limited. One major obstacle is the lack of understanding of the relationship between genotype and emergent phenotype, the mechanisms by which pathologies occur, and the identification of factors that cause clinical variability between and within families. We are currently studying three affected families each with different mutation in the Lamin A/C (LMNA) gene. LMNA encodes the main protein of the nuclear lamina, the structural matrix of the nuclear envelope that interacts with both chromatin in the cell nucleus and the cytoskeleton. In these experiments, it has been noticed that the nuclei often have a wide variety of geometrical defects, including rounded protrusions which we will refer to as “nuclear blebs”. This is a known property of LMNA mutated cell lines (such as in progeria), however the mechanisms by which such defects forms are unclear. It is known that the LMNA mutation impacts the nuclear lamina, which is present at the inner layer of the nuclear membrane. We use mathematical modeling to investigate possible mechanisms of LMNA mediated nuclear shape deformations.

Questions:

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