



# Faculty of Engineering and Applied Science

## Chemical Engineering Seminar Series



### **Microscale tissue-on-chip technologies: watching biology function in high-definition**

Dr. Christopher Moraes/McGill University

Thursday, February 09, 2017, 2:30pm

Dupuis Hall, Room 215



#### **ABSTRACT**

In addition to genes and proteins, physical factors in the microenvironment play a pivotal role in driving cell and tissue function. Ignoring these complex factors in conventional tissue culture systems makes the translational utility of in vitro cultures uncertain. Our lab focuses on reconstructing realistic miniature versions of biological tissues, using a variety of microengineering technologies. These 'on-a-chip' systems may ultimately be used to predict disease progression, stratify patient risk groups, and identify potential therapeutic strategies. More immediately however, the throughput, precision and dimensions of tissues engineered at this length scale provide a remarkable capacity to 'watch' biology happen in unique ways. For example, remodeling the extracellular matrix is a critical component in the feedback loop driving disease progression, but our technical capacity to measure the mechanics of 3D tissues undergoing complex remodeling is severely limited. In this talk, I will describe recent and ongoing work in which we develop novel strategies to recreate the 3D tissue microenvironment, and construct dynamic 'maps' of tissue mechanics during morphogenetic programs associated with disease progression.