

BME 3rd Year Seminar Series
Friday, October 11th, 2024
1:30 – 2:30 PM EST
MJIS 1001

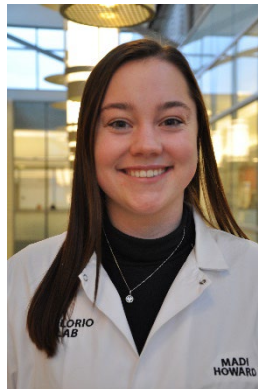
Evaluation links:

Madison Howard: https://purdue.ca1.qualtrics.com/jfe/form/SV_08MDhFxpPW67Mgu

Rahaf Salim: https://purdue.ca1.qualtrics.com/jfe/form/SV_9vLNLXxKSAPUenI

Evaluation surveys should only be completed after the seminar has taken place, and only by those who attended the seminar.

Stretching the Limits: Unveiling Key Matrix Factors and Survival Mechanisms in the Metastatic Tumor Microenvironment
Madison Howard (Luis Solorio, advisor)



Abstract: Breast cancer (BC) often metastasizes to organs experiencing high mechanical stress, including the lungs. Despite this knowledge, the effect that dynamic forces native to the lungs have on early disseminated tumor cells is a currently under explored area of the metastatic cascade. Recent *in vitro* findings suggest BC cells enter a dormant state in response to tensile stress, yet the mechanisms by which these cells adapt to the dynamic conditions at metastatic sites remain unclear. *In vitro* cell stretching experiments and *ex vivo* tissue characterization could help uncover the mechanisms behind this mechanical adaptation, but the capabilities of existing testing platforms are limited. Here, we developed a simple and cost-effective in-plane actuation platform with high-resolution force sensing and simultaneous imaging capabilities. We will demonstrate the device utility for *ex vivo* tissue characterization by analyzing transient mechanical changes in murine metastatic lung tissue. Given that the extracellular matrix (ECM) is a main driver of tissue stiffness, this study will be paired with a proteomic analysis to identify transient changes in ECM composition throughout disease progression. To further investigate BC dormancy at the cellular level, an existing magnetic actuation platform will also be used to investigate how varying levels of strain energy affect the proliferation and mechanotransduction

signaling of BC cells. Together, these aims will address gaps in current testing systems and provide insight into the mechanical adaptation mechanisms driving metastatic BC at both the tissue and cellular levels.

Title Forthcoming
Rahaf Salim (Deva Chan/Matthew Ward, advisors)

Abstract: Not yet available