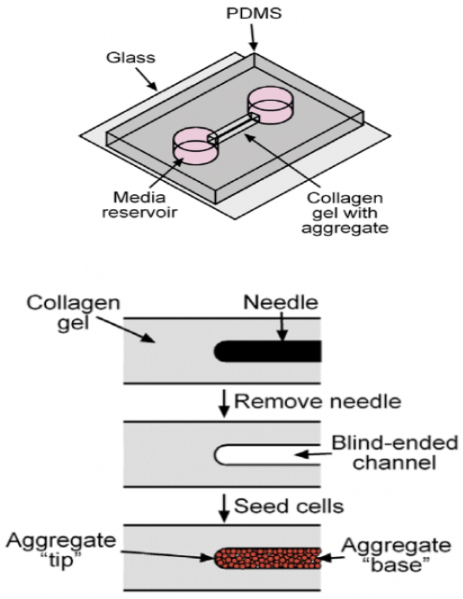
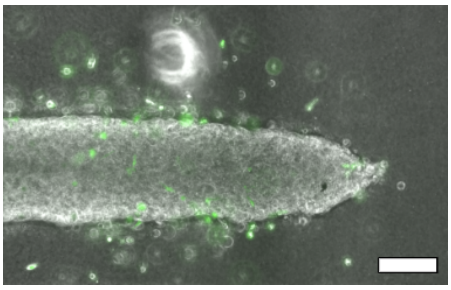
# Developing an In Vitro Model of Luminal Breast Cancer

Team 3: **Owen Kelly, Anushka Rathi**
Advisor: **Joe Tien**

Luminal breast cancer originates within the luminal epithelium of mammary breast ducts. These epithelial cells normally express estrogen receptor (ER), and most cases of luminal breast cancer are considered to be ER-positive (ER+). Creating a model for metastatic ER+ breast cancer, in which cancer cells migrate from the original tumor, travel through the vasculature, and form a new tumor elsewhere, may enable the development of more effective treatment of luminal breast cancer. Currently, few models of metastatic progression of ER+ breast cancer exist. The goal of our project is to engineer an in vitro model, using human breast cancer cell lines, to characterize the first two steps of metastasis in ER+ breast cancer, specifically invasion of the cells into the extracellular matrix (ECM) and escape of the cells from the ECM into vasculature. To create this model, we altered a needle-based approach that was originally developed for triple-negative breast cancer (TNBC). Because ER+ cells are less invasive than TNBC cells are, we modified our model to achieve more aggressive invasion for ER+ cells. These modifications consisted of 1) optimizing the collagen concentration in the model, and 2) introducing a small (1%) sub-population of TNBC cells with the ER+ cells to enhance the invasiveness of the latter.




Tien J, et al. *PLoS One*. (2012)



Guide:
Green cells: GFP+ triple-negative breast cancer
White cells: ER+ breast cancer
Scale bars 200 μm