INTRODUCTION

- To gain a better understanding of uterine tissue contraction, we need to have more effective models and ways to study the myometrium.
- The myometrium is the middle layer of tissue in the uterus.
- Myometrial smooth muscle plays a large role in:
  - Menstruation - expels endometrium
  - Labor - rhythmic contractions to break the fetal membrane and push fetus through birth canal
- There is little understanding of how the myometrium responds to biomechanical and biochemical stimuli.

OBJECTIVE

To engineer a stretch chamber that can be used for measuring contractile forces of myometrial smooth muscle cells.

METHODS

1. Creating lane stamps out of PDMS for the stretch chambers
   - PDMS is a silicone polymer used in labs for making imprints of stamps for cells. PDMS is a great option for making stamps because it is biocompatible, accessible, and porous.
   - Assembling stretch chambers
     - We add a new membrane to the stretch chamber because the membranes that it comes with are less compatible with microcontact printing. By using a new membrane, the stretch chambers also become reusable because the new membrane is replaceable.
2. Microcontact printing & fibronectin antibody staining
   - Microcontact printing is used to transfer the pattern from out PDMS lanes onto the stretch chambers. This is where the cells will be cultured.

DATA

Calcium imaging of PDMS lanes for myometrial smooth muscle cells

- Test images from the microscope will measure how well cells adhere to the lanes
- Images depict 40 micron lanes because the stamp off caused the 75 micron lanes to become inverted

REFERENCES