Chip Preparation

1) Gather an ice bath, conical tubes, collagen type I, Magnesium Chloride, Calcium Chloride, 1ml, 5ml, & 10ml syringes, PDMS microchips, petri dishes and aluminum foil

2) Remove the tape from the PDMS microchip and plasma treat using protocol 2 on a petri dish covered by aluminum foil

3) Create a solution with a concentration of 100ug/ml collagen type I diluted in PBS (-/-) and place it in a conical tube and in the ice bath

4) Create a solution of 750ul of $MgCl_2$, 1ml of $CaCl_2$ and 8.25ml of deionized water into another conical tube and then an ice bath

5) Use a 1ml syringe to push the collagen solution through the PDMS microchannels until the solution comes out the other end and there are no more bubbles present in the channels

6) Plug the holes of the PDMS microchip using cut off ends of 5ml syringes (possibly to be replaced with 3D printed models in the future

7) Place the microchip in a petri dish with a PBS bath with the lid closed and incubate at 37 degrees Celsius for about 1 hour

Vessel Simulation

1) Create cannulas out of 5ml syringes

2) Mix 18ul of fibrogen and 10ul of calcium with 6ml of patient blood.

3) set a syringe of 5ml of PBS into a dosing pump set at a pulling flow rate of 70ul/min

4) Connect tubing from the PDMS syringe to one of the chip's ends

5) Attach one of the previously made cannulas to the other end of the chip

6) Connect a pressure sensor to the PDMS syringe

7) Properly secure the chip to the microscope to be observed

8) Boot up the camera of the microscope and run some test images

8) Dispense 1ml of blood into the chip via its canula

9) After a few minutes, dispense 100ul of the previously made $MgCl_2$, $CaCl_2$, and water solution

10) Ideally, observe a dip in pressure right before the blood sample reaches the syringe

11) Dispose of blood chip, tubing, and other excess material and turn off the microscope

Taking Images

1) Open "Gen 5 3.10"

2) Pick "Imager Manual Mode"

3) Press “Capture New”

4) Select “All” under “Filter”

5) Select “Abidemi” for vessel type

6) Change the image mode to “Phase contrast” located at the top left of the page

7) Got to the highest point of the section of the channel being imaged

8) Press “imaging mode” and check “montage”

9) Press “set top”

10) Go to the lowest point of the section of the channel being imaged and press “set bottom”

11) Go to the right-most point of the section of the channel being imaged and press “set right”

12) Go to the left-most point of the section of the channel being imaged and press “set left”

9) check “kinetic imaging”

10) click “edit imaging step”

11) click “start kinetic”