

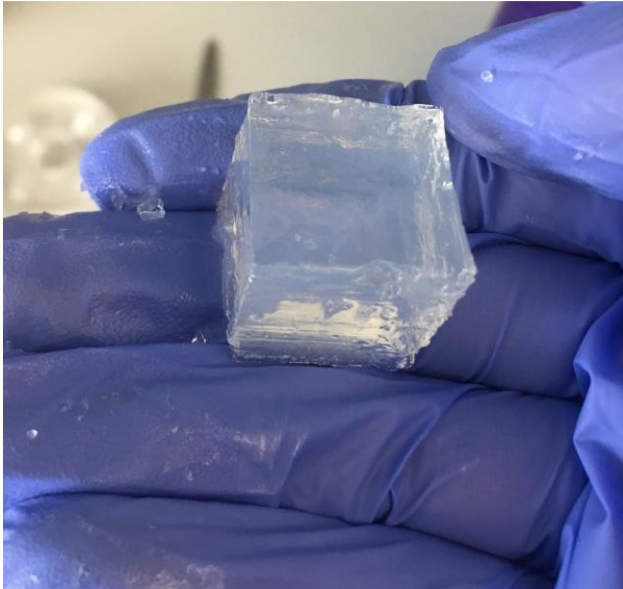


Summer Research Internship

George Washington University Engineering
Department

Morgan Bedingfield

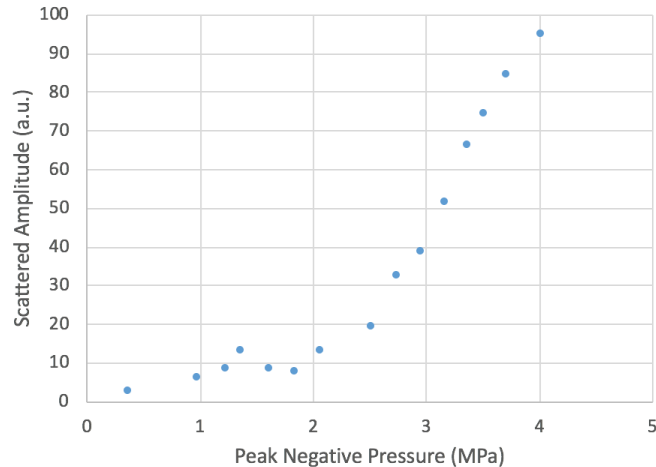
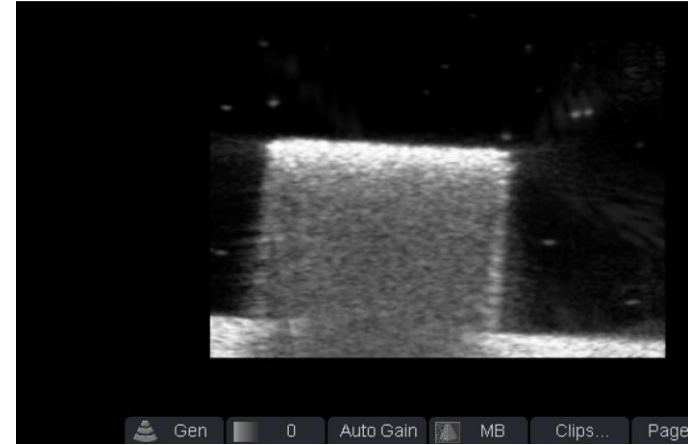
Our Project



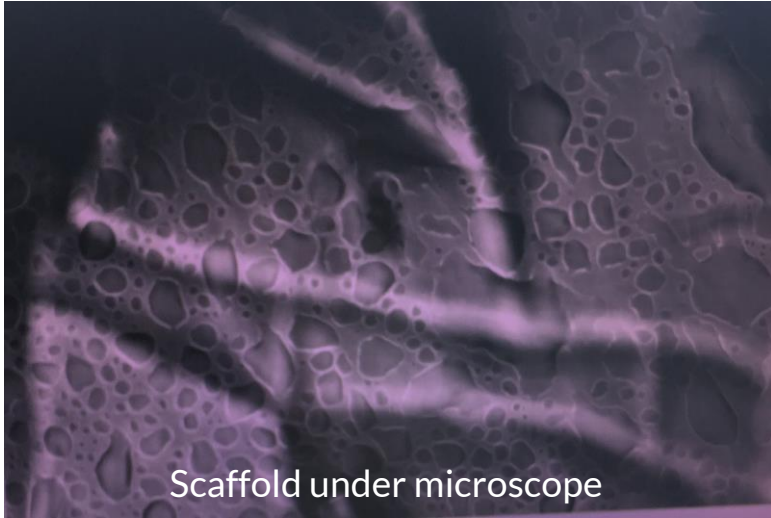
- Creating a cube-shaped scaffold made out of Gelma, a jello-like material, which contains droplets with liquid cores of perfluoropentane and perfluorohexane
- Droplets vaporize at high enough pressure
- We are attempting to implant the scaffold in a liver or other soft tissue to help with targeted drug delivery

Our Results

- Droplets are vaporizing when imaged using ultrasound waves
- The experiments are ongoing
 - Determining if the ultrasound is in fact causing the vaporization and at what pressures
 - Working with the FDA to ensure scaffold can be implanted into body



My Role

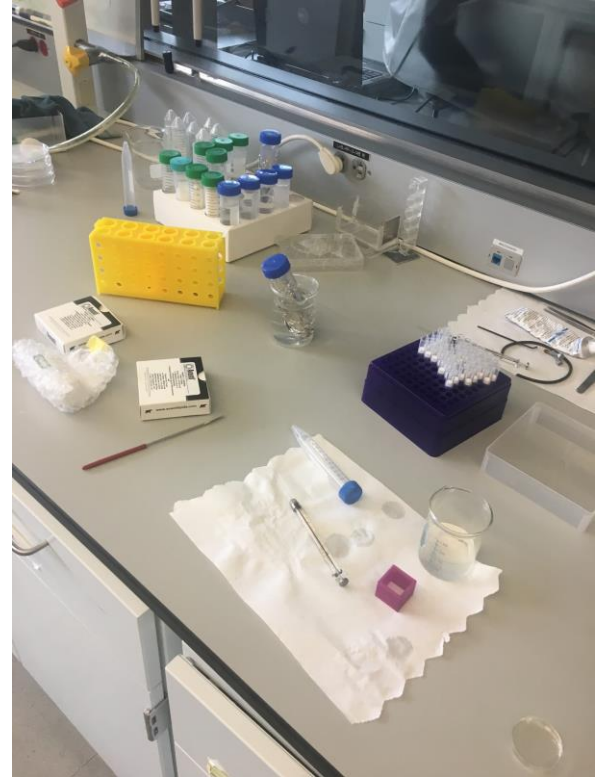


Scaffold under microscope

- Run experiments and record data
- Create code in MATLAB to analyze data
- Make models of parts to 3D print for our experimental set up
- Research scholarly articles to find people who had previously conducted similar experiments
- Create microbubbles, droplets, and Gelma scaffolds

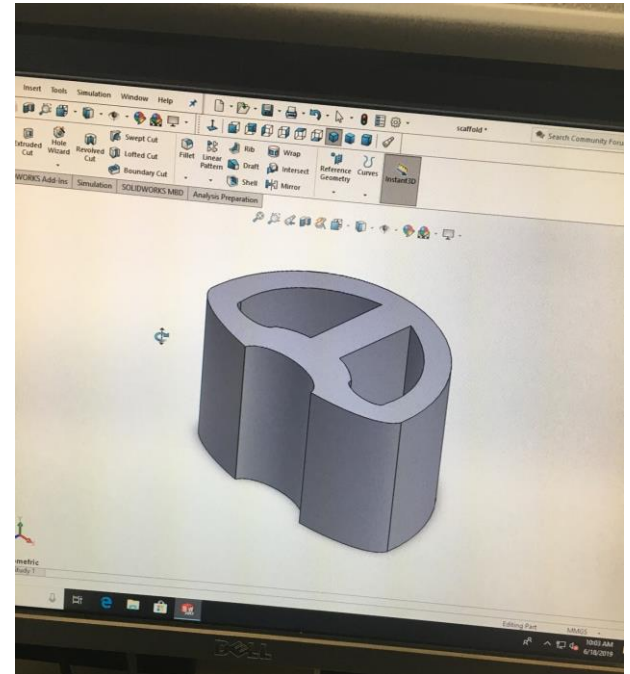
Procedures I Learned in the Lab

- How to make microbubbles and droplets from a lipid solution
- How to use Solidworks , MATLAB, and Fiji
- How to use a centrifuge to separate droplets by size
- How to take pictures of a sample under a microscope
- How to read and summarize scholarly articles



Challenges Faced/Mistakes Made

- Forgetting to save my work and then losing 5 3D printed parts when Solidworks crashed
- Measuring 80 milligrams of lipids instead of 8 because I forgot how to convert units
- Making 3D printed parts in inches instead of millimeters and almost printing a 120-inch part
- Not being able to get out of my house in the morning due to flash floods





Lessons I Learned in the Lab

- Communication is key
- Don't be afraid to ask questions
- Be open to collaboration
- Approach problems from many different angles to find a solution
- Take advantage of your time and learn as much as possible



Thank You:

- Jenna Osborn
- Dr. Sarkar
- Mr. Lee
- Dr. Krug



Thanks for listening!
Questions?