**Introduction**

Microfluidic technologies have recently emerged in the biological sciences as a method to gain control over biological processes. Microfluidic devices leverage micro and nanoliter quantities of fluids to perform high throughput experiments, individual cell manipulation, and genetic circuit assembly.

The Microfluidics track is a new track in the iGEM competition and Vanderbilt Microfluidics is a brand new team to the iGEM competition. As such, our team focused on the beginning stages of microfluidic development in order to better understand the field and lay out the direction we intend to pursue in future iGEM competitions.

**Purpose**

There were three main goals for our project.

1. Learn the microfluidic design and development process and select platforms for design that are easily accessible and readily understood by various skill levels. Educate college students and high school students on the design process.
2. Investigate methods of microfluidic device design, fabrication, and manufacturing to determine the most easily accessible methodology for iGEM teams to utilize.
3. Develop a novel microfluidic device capable of capturing E. coli and manipulating flows. Through the manipulation of flow we hoped to modulate the quorum sensing capabilities of the trapped E. coli and by coupling quorum sensing with GFP expression, modulate fluorescence of the bacterial population.

**Materials/Procedure**

Microfluidics and Quorum Sensing

1. PDMS
2. Syringe pump, Harvard Apparatus
3. Vinyl cutter from Silhouette
4. Filter Paper

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**Future Research**

Our future goals involve incorporating microfluidics research and devices into synthetic biology applications. Specifically we would like to explore the creation of a universal microfluidic package system which is able to be easily manipulated by synthetic biologists to perform a variety of laboratory processes.

Also, we hope next year to incorporate our project into the aims of the Vanderbilt Synthetic Biology iGEM team and work collaboratively on a year end project.

**References/Acknowledgments**