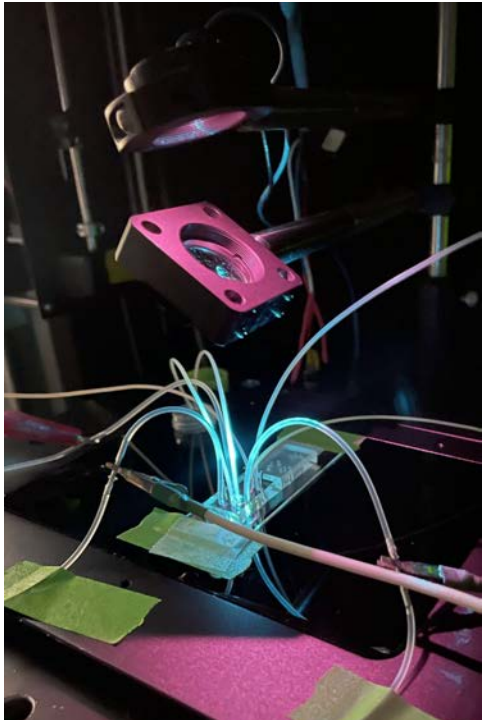
Developing a Novel Droplet Sorting Device Using Electrophoresis

Zabari-Obyoni Bell, Rohan Thakur and Robinson Tom, Dr. David Weitz
Navajo Technical University, Harvard University
NSF DMR-2122195

Droplet-based microfluidics hold enormous potential for transforming the way that many biological experiments are performed. Use of microfluidic drops as self-contained miniature “test tubes” for biological experiments, allows for greatly increased throughput while reducing reagent volumes compared to traditional methods. Traditional droplet sorting uses dielectrophoresis and uses different systems to promote selective droplet sorting, which is typically slow or lower throughput. We instead use picoinjection to charge droplets, allowing sorting by electrophoresis. Sorting by electrophoresis should be faster than dielectrophoresis, and droplets can be sorted by electrophoresis simultaneously. This means that we can increase droplet sorting throughput by scaling up the size of the sorting region. This manufactured our own microfluidic devices and modified the geometry of the sorting design on the present chip.



Microfluidic chip under laser

Developing a Novel Droplet Sorting Device Using Electrophoresis

Zabari-Obyoni Bell, Rohan Thakur and Robinson Tom, Dr. David Weitz
Navajo Technical University, Harvard University
NSF DMR-2122195

My name is Zabari and I am a recent biology graduate from Navajo Technical University. Through my time doing research at Harvard University this summer, I learned about the many biological applications that can be obtained through materials science and specifically in microfluidics. Along with the techniques I've picked up from working in the lab, I have been given the opportunity to solidify my career and educational plans. This fall, I'll be starting a post-baccalaureate program here at Harvard, that provides mentored research and training for individuals interested in pursuing doctoral studies.

(left to right): Tionna Tapaha, Robinson Tom, Zabari Bell, Rohan Thakur