Week 5 Report

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We have continued literature research for solutions to our problem. We have found a couple labs that have created systems to facilitate the process of attaching carbon fiber nanotubes to a micro-electrode array. The largest problem we find is the difficulty in creating/fabricating each solution. Most solutions use a biomaterials science approach - creating a device that will interact favorably with the carbon fiber to control their placement.

One device that does so uses a photolithography process onto a silicon resist to create a grid system to feed the carbon fiber through. However, the publication also discusses using concentrated HF etching, a dangerous process that should be eliminated if possible. While this lab poses a viable solution, it would not address the high-throughput/low time investment aspect we are searching for[1].

Another lab uses a coating process and a silicon-based microdevice to control placement of the carbon fiber nanotubes. While the fabrication process seems simple, the lab uses a 16-channel array for their studies. 16 channels provides much more space that our array of 64 electrodes might not have. Thus, the process might not work for an array of our density[2].

This week we also reached out to a lab member who does the current construction of the arrays in an effort to shadow and understand the process. We will likely be meeting with her this afternoon (9/27).

References:

1. https://www.biorxiv.org/content/biorxiv/early/2018/05/13/320937.full.pdf

2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4789140/