

3D Printed Stretchable Microneedle Electrodes

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Introduction

The micro serpentine was the main focus of our research at our lab. My mentor needed to find what type of micro serpentine would be durable enough to withstand being manipulated on a muscle. The needle also needed to be able to stay in the skin through continued movement.



Microneedles designed to not back out of the skin.

Objective & Impact of Professor's Research

Professor Zhao's research is focused on finding a way to track muscle movement with micro sensors. These sensors need to be able to not break during muscle movements. The serpentine needed to be able to stretch and bend for this to be possible. This could be used in medical applications to track how muscles move in certain applications.



Examples of flexible electronic sensors

During my time at Shine I have picked up many new skills. This includes learning how to use modeling software such as Auto CAD and Fusion 360.

Skills Learned

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Auto CAD drawing of final micro serpentine design

also learned how to operate a microscope and take close up pictures of my models and how to test my own designs.



Picture of micro serpentine taken with microscope





One of my designs being tested (stretched to 80% of original length)

How This Relates to Your STEM Coursework

SHINE

Summer High School Intensive in Next-Generation Engineering



Fusion 360 model of final micro serpentine design

Final model being stretched and twisted

The Shine experience gave me an understanding of how research turns into testing and then into a product. I was able to see different processes and procedures within the lab.

Next Steps for Me

I am planning to use my new knowledge from Shine in classes in upcoming years and for my career. This understanding in engineering will go a long way to help me towards a job in engineering.

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School of Engineering K-12 STEM Center