Project Summary

# Overview

Providing a functional vascular network in new tissues is essential for their survival and proper functioning. Micropuncture procedures were proven to promote angiogenesis by causing an increase in the release of certain signaling factors. The existing approach to micropuncturing involves the manual use of a microneedle, which proves to be impractical. This project was sponsored by Penn State College of Medicine and focused on developing a two-piece device that would make simultaneous micropunctures along a blood vessel to promote angiogenesis.

# Objectives

The objective of this project is to design and manufacture a micropuncture surgical device that will simultaneously make multiple, evenly spaced micropunctures along a blood vessel to induce angiogenesis.

# Approach

* Conducted biweekly meetings with sponsors from Penn State College of Medicine to gather the device needs and requirements, receive feedback and present our ideas
* Concept sketches were created to perform concept generation and selection to decide what prototype design to further work with
* A patent search was performed to study any existing devices and analyze the market
* CAD designs were created on SolidWorks to be 3D printed and tested
* Multiple prototypes were designed and 3D printed in order to finalize the prototype
* Three tests were performed on the final prototype to prove its efficiency, accuracy, and rate of performance