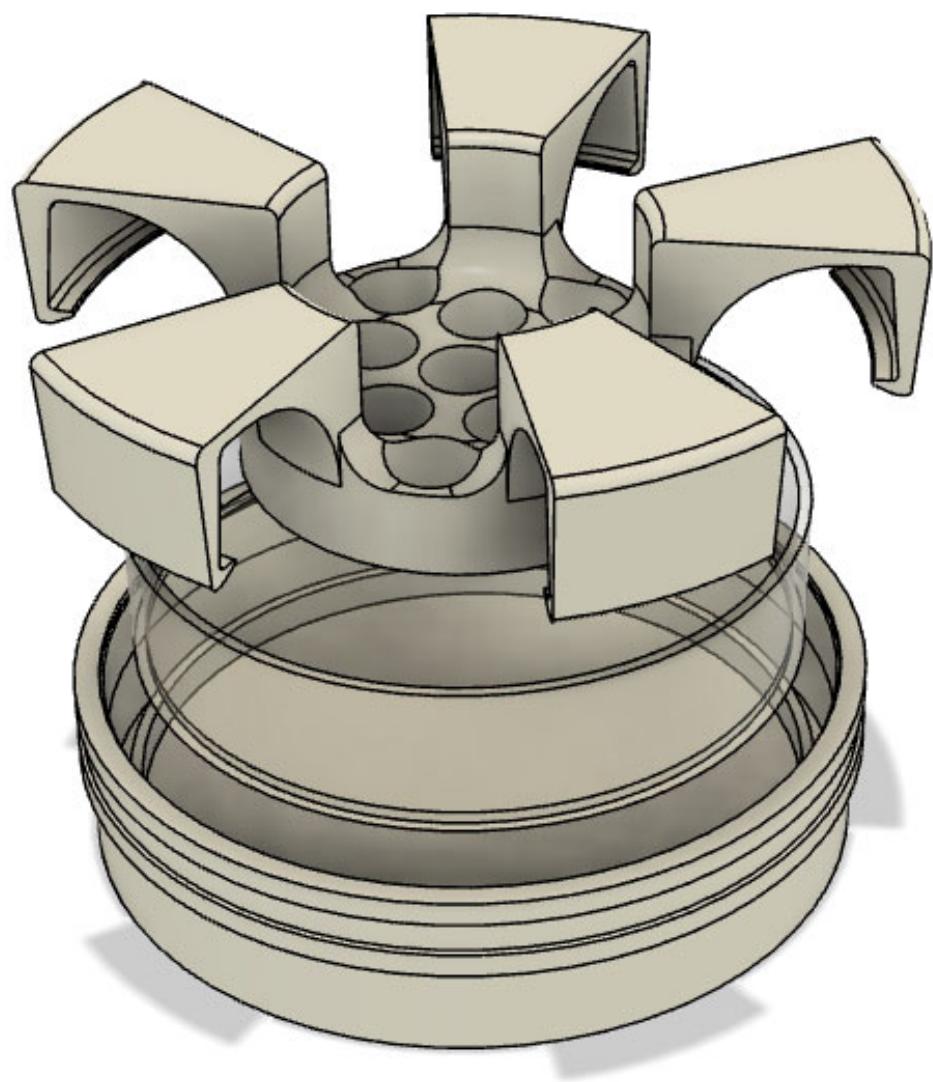
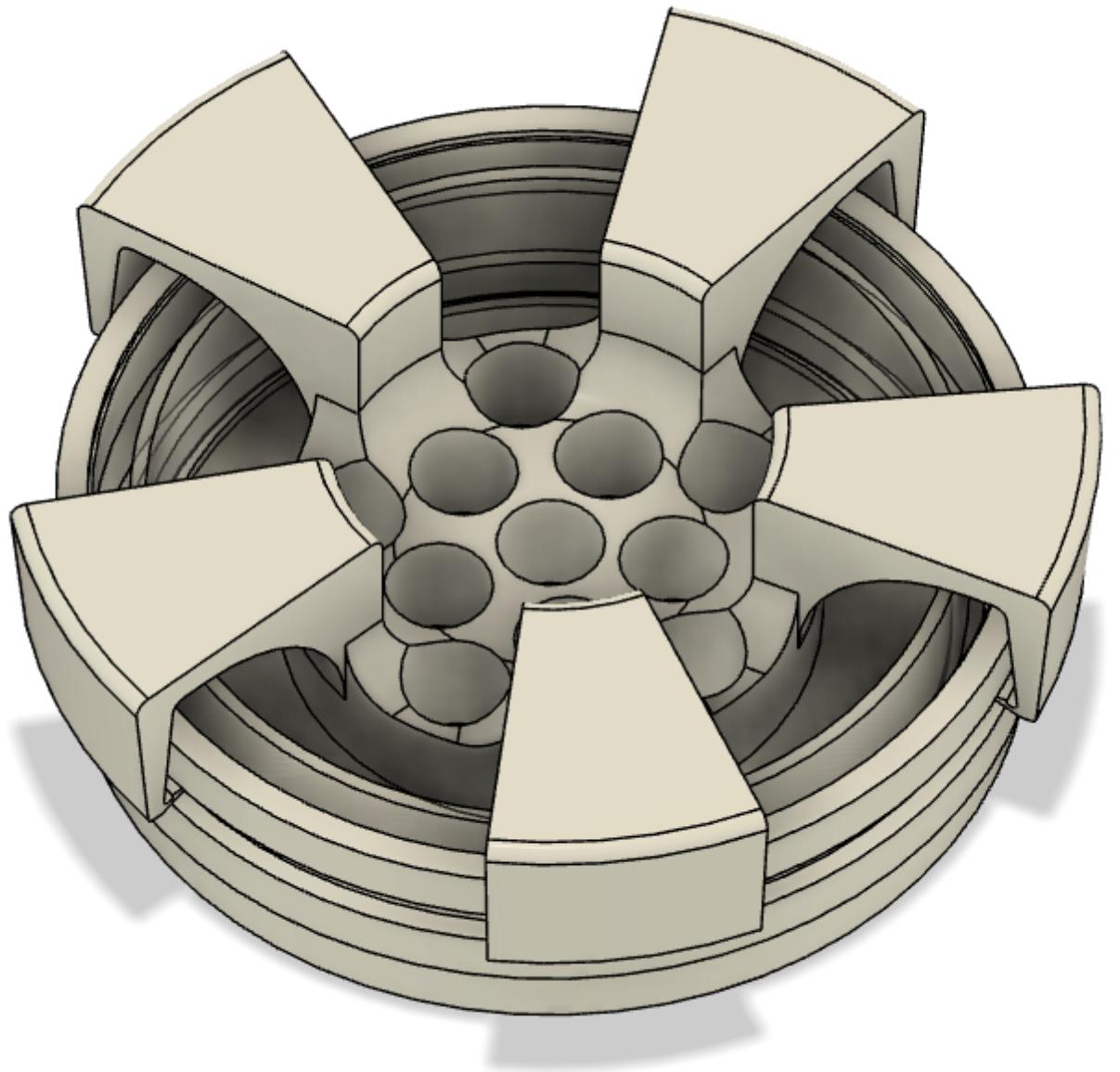


# CAD Portfolio

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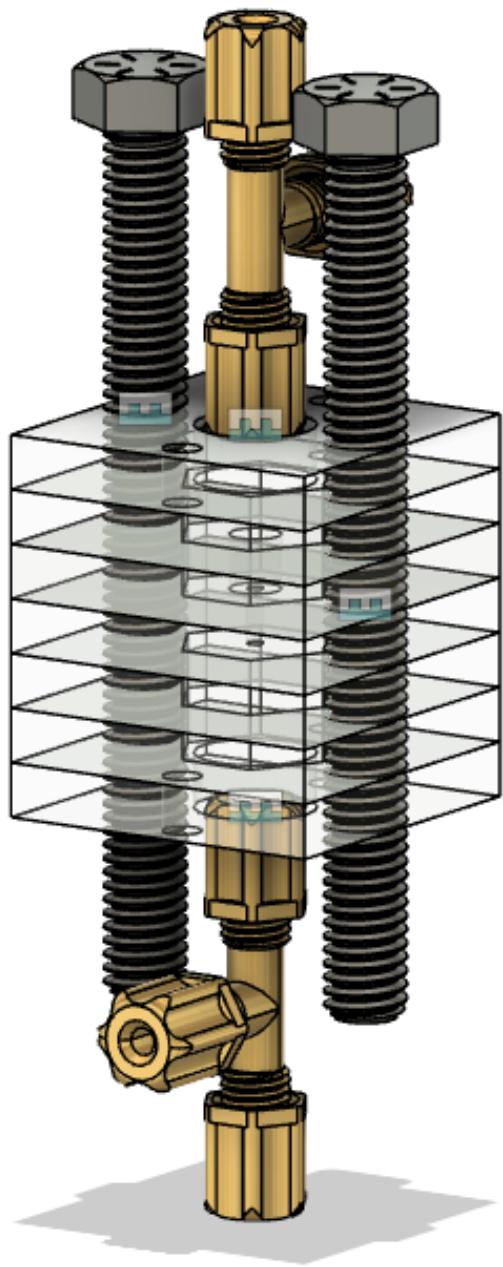
THE UNIVERSITY  
*of* NORTH CAROLINA  
at CHAPEL HILL



**Tissue Carrier:** This novel Tissue Carrier device is a past research project. This involved optimizing the snap-fit joint via iterative testing with 3D-printed prototypes to provide a water-tight seal when a hydrogel disk is inserted between the top and middle pieces. The goal of this device is to provide a high-throughput method of production for cartilage tissue from genetically engineered primary human cartilage cells.



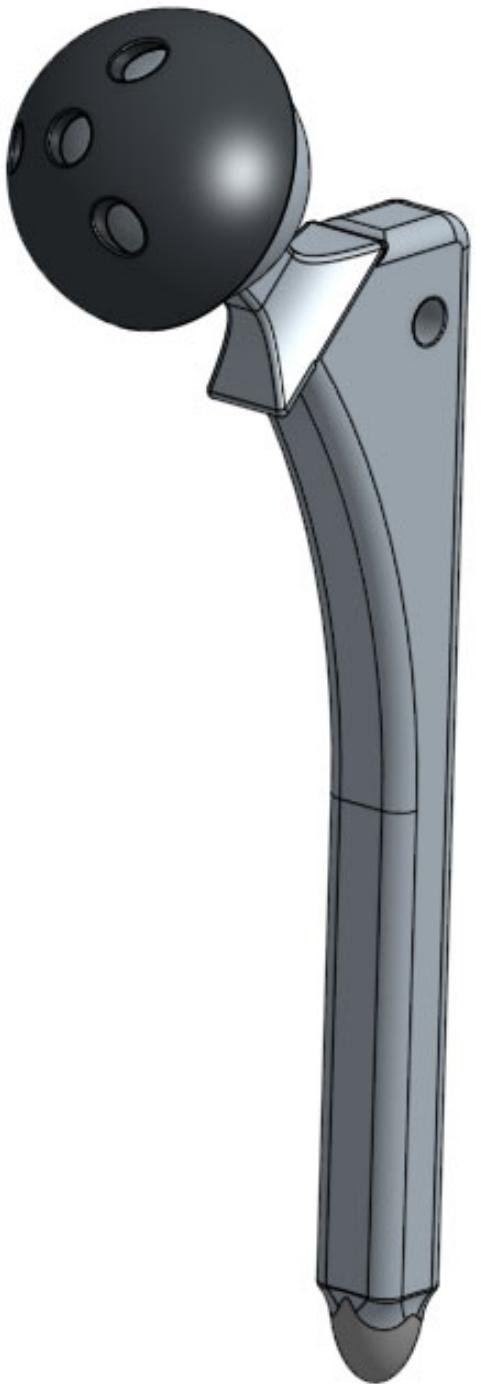
**MagnaPress Squish Cap:** Two component device that was 3D printed and implemented to hold dish containing cartilage sample for integration in mechanical system for simulation of load on tissue sample.



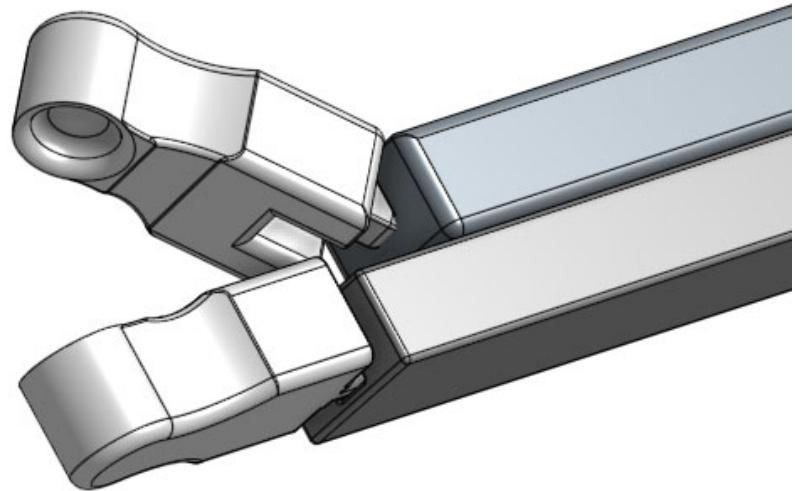
**Cartilage Sample Holder:** Fusion 360 sketch of cartilage holder to be laser cut from acrylic, and integrated into an infusion pump system with pressure sensors.



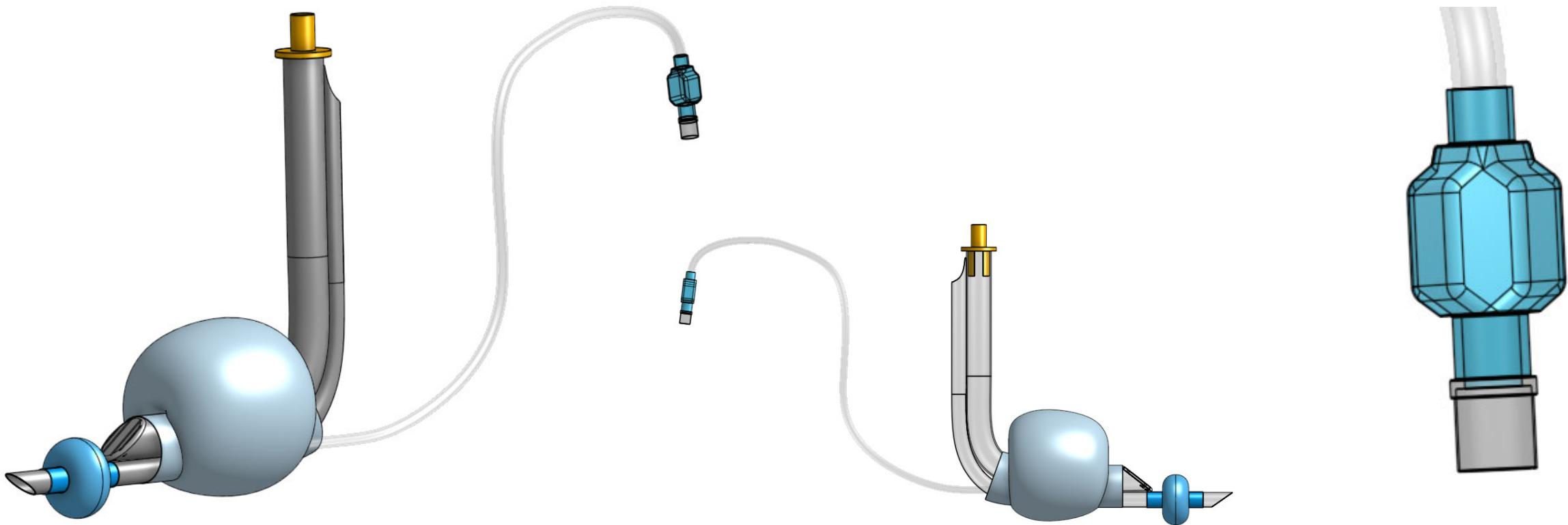
**Internal Defibrillator Paddles:** Reproduced from an image



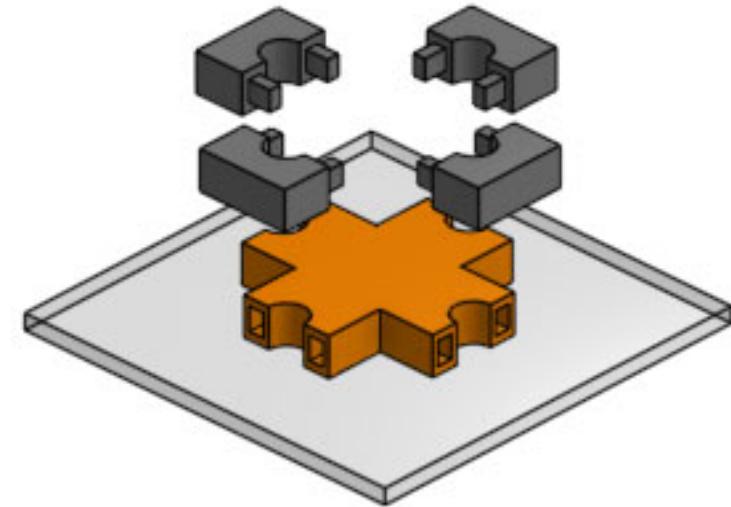
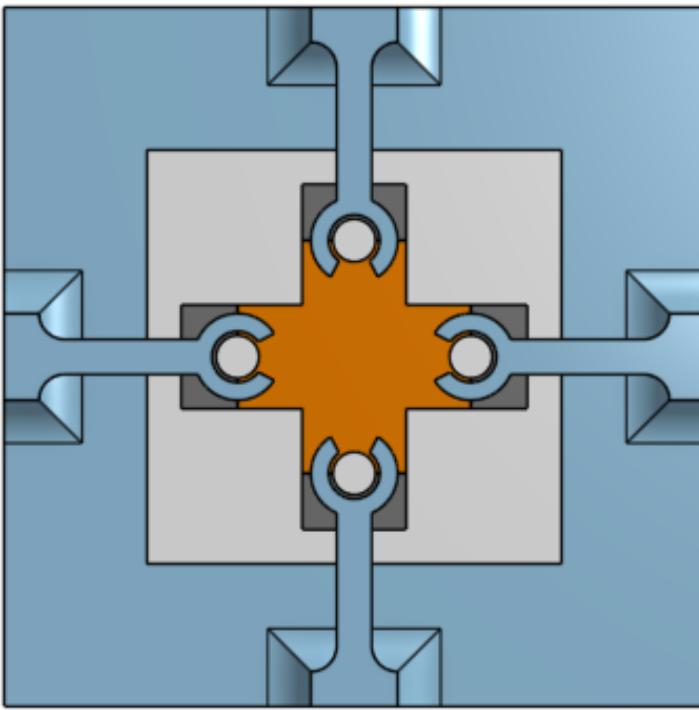
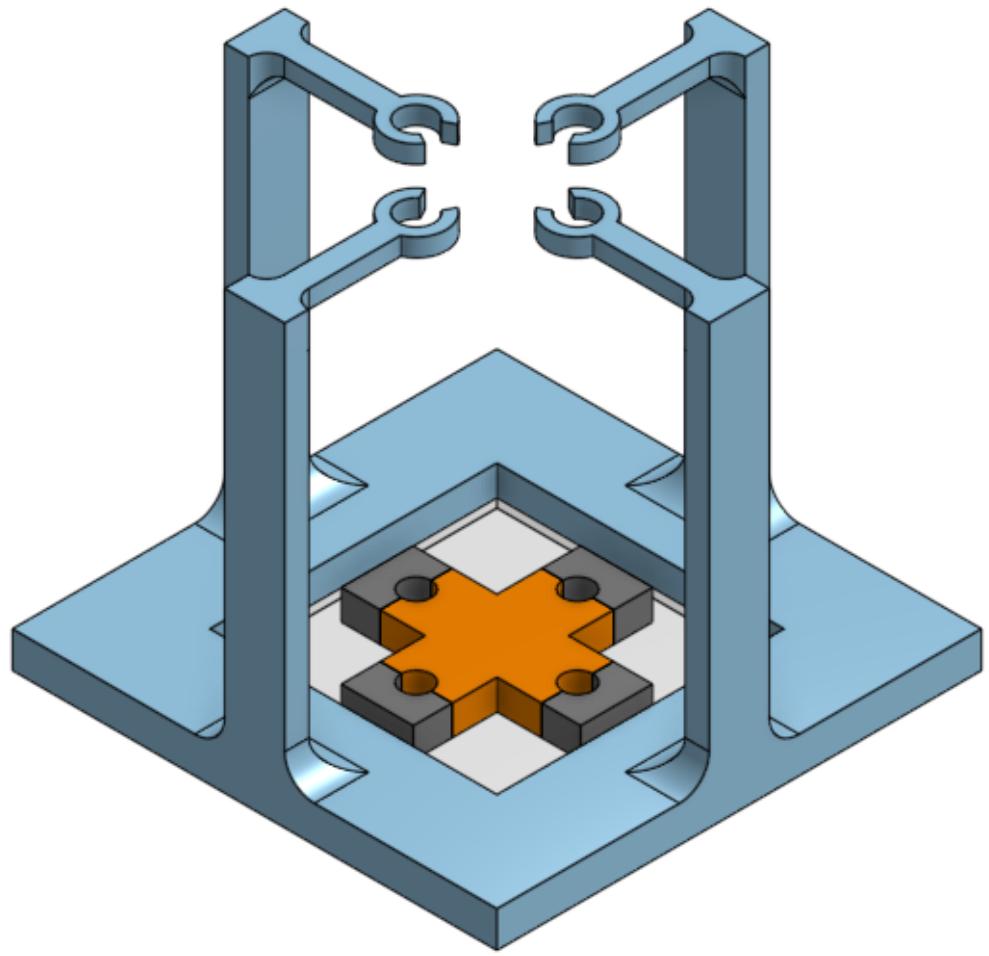
**Hip Implant:**  
Produced from image  
with specifications.



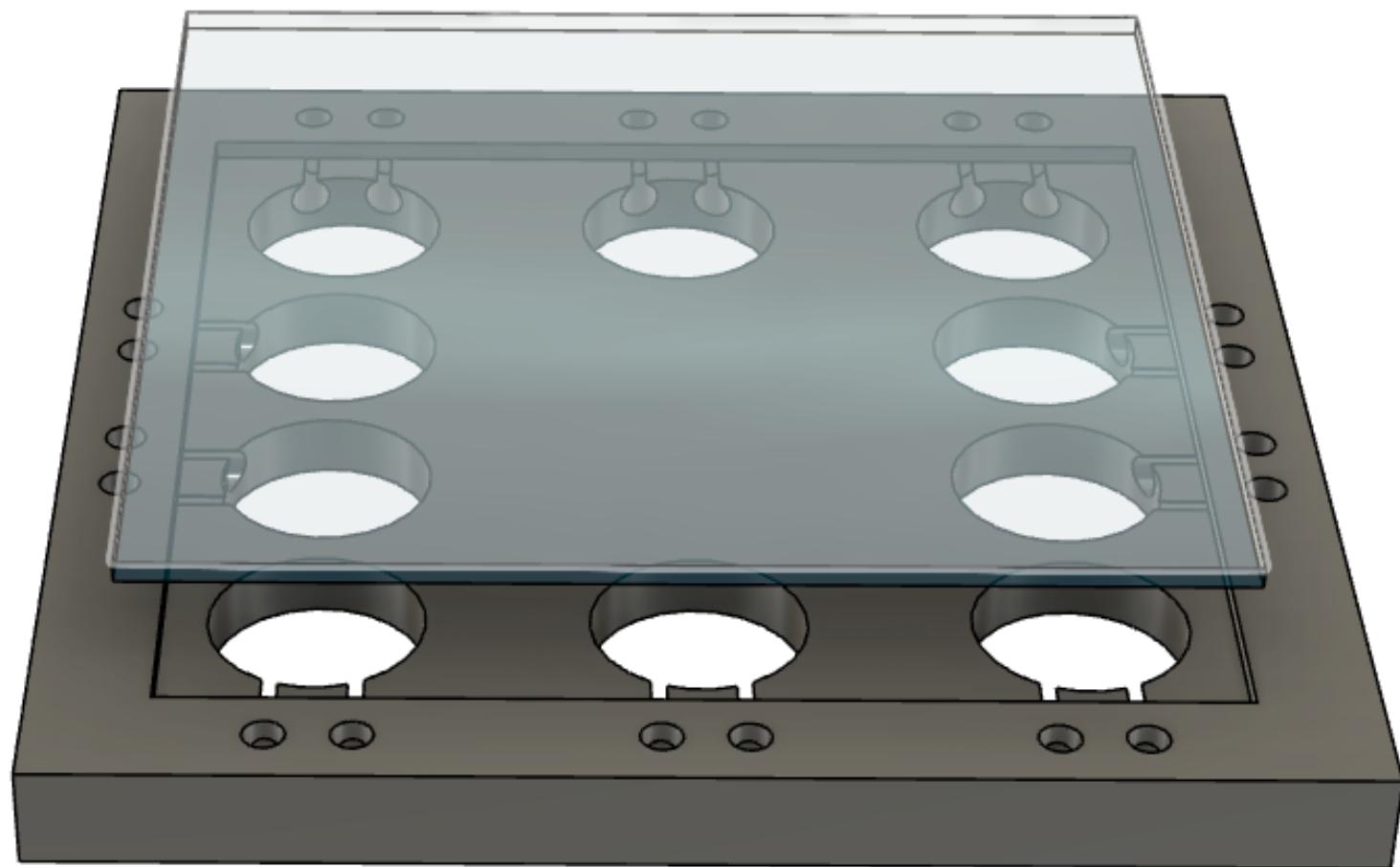
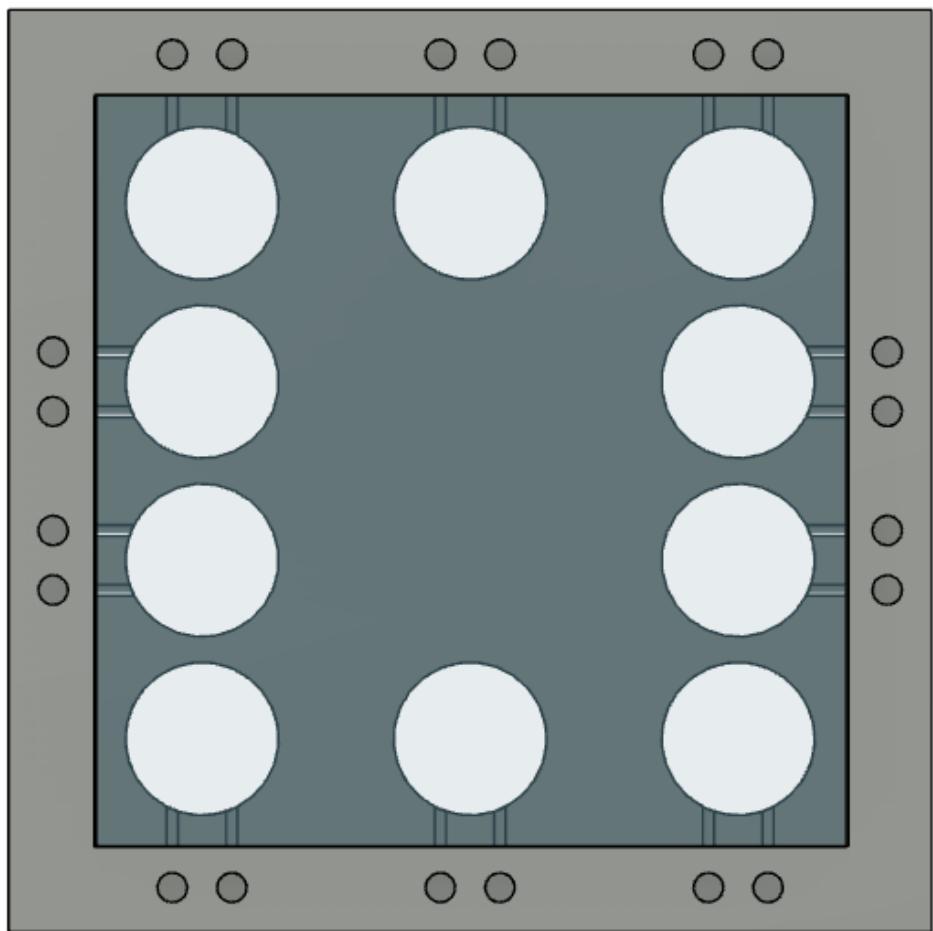
**Biopsy Forceps:** Reproduced from an image.



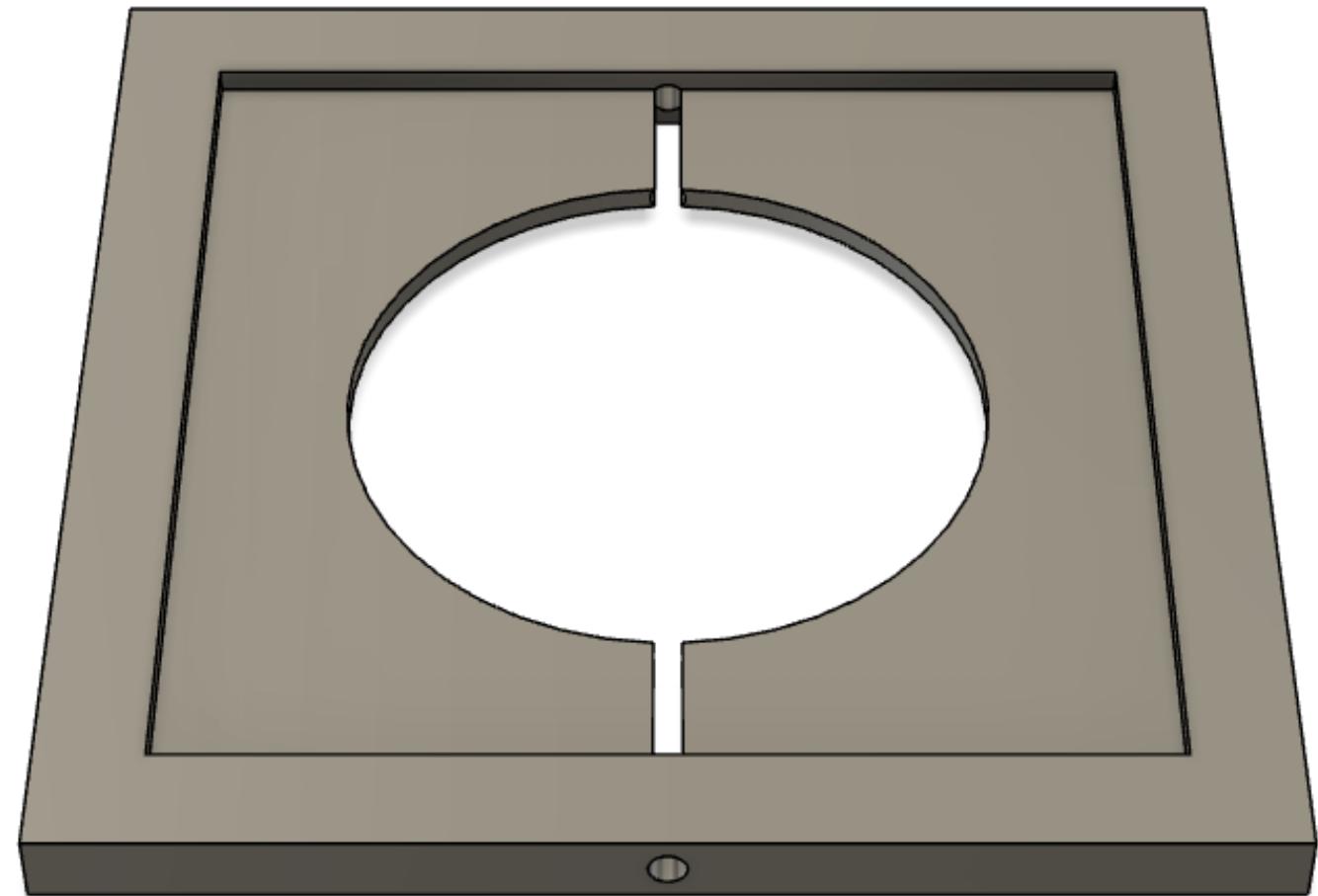
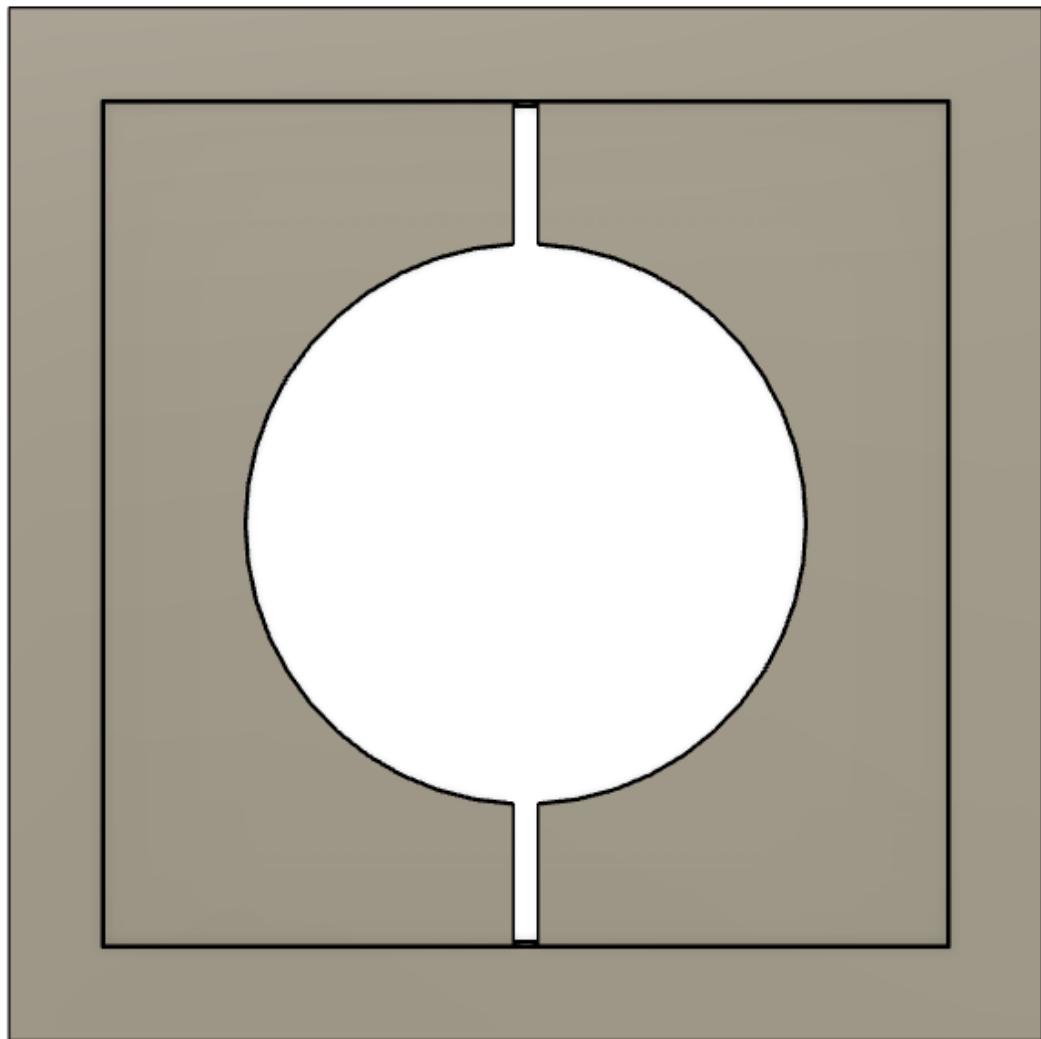
**Endotracheal Tube:** Complex design reproduced in inflated state from an image. Composed of six separate parts and assembled together.



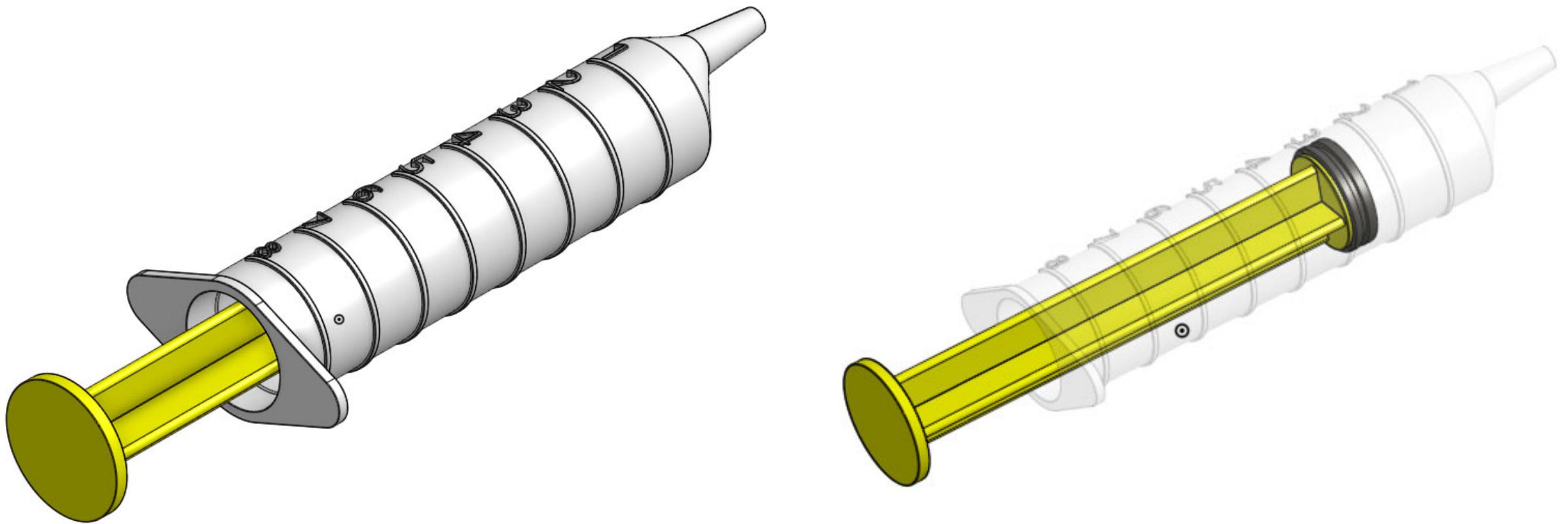
**Mouse Hip Hydrogel Maker:** Device I independently designed to meet the need to surround mouse hip tissue with a hydrogel matrix in my research lab. Device is used in conjunction with a syringe for holding the tissue in place, and a glass plate to ensure UV light can reach the hydrogel mold cylinders. The mold pieces are detachable for easy removal as well. This design is currently being 3D printed and tested for use.



**Multiple Gel Maker:** This is one design for a device that will help to quickly create many small hydrogel discs for application in the Diekman Lab's projects.



**Single Gel Maker:** This is another design that I have modeled for a device that will create a single large hydrogel disc. I am currently 3D-printing this model in conjunction with the tissue carrier to determine the optimal size and thickness of the produced discs. The cutout on both sides is needed to allow the clamping of glass plates to constrain the hydrogel fluid before subjected to UV light treatment.



**Syringe:** Functional syringe reproduced from image.