



Synthetic Tissue Model for Bipolar and Monopolar Electrocautery

Hydrogel Tissue Phantom Development

Problem

As ethical concerns over animal and cadaveric testing gain more influence in medical device development, the need for complex anatomical models is growing. Advances in 3D bioprinting and hydrogel development, though currently still primarily academic, allow for complex geometries and shapes to be generated as synthetic tissues and organ models.

However, many hydrogel systems still lack some of the specific behaviors observed in natural tissue. When high energy intervention devices (e.g., electrocautery, radiofrequency ablation, laser cutting) are used to cut away natural tissue, the tissue chars and may produce smoke.

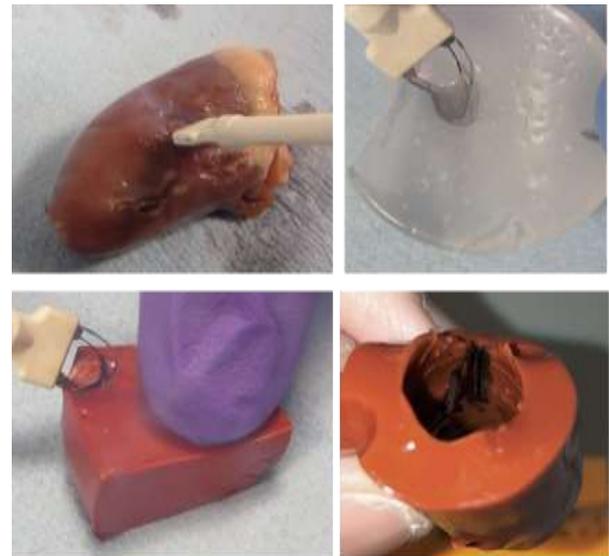
The importance of capturing these types of niche behavior in a tissue model are crucial for adequate surgical training and product design. Although hydrogels can mimic mechanical properties of tissues, many hydrogels or commercially available synthetic tissue systems are not capable of charring. Instead, synthetic tissue phantoms typically melt under relevant high energy interventions.

Solution

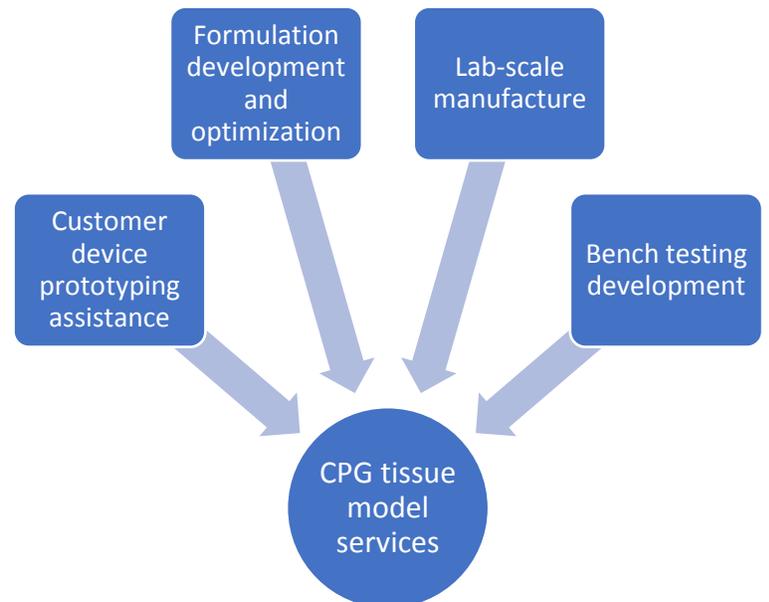
CPG has developed the 'e-tissue' synthetic tissue for use with bipolar and monopolar electrocautery. Taking inspiration from the Maillard reaction, our e-tissue produces char and smoke similar to natural tissue (represented by a chicken heart in this note).

Why CPG for Your Synthetic Tissue Model?

CPG leverages hydrogel expertise to help medical device developers and tissue model designers for custom formulation development and lab-scale manufacture.



Comparison of bipolar electrocautery of chicken heart (upper left) and CPG's e-tissue formulations (other 3 images)



ANALYTICAL TESTING
BIOMEDICAL MATERIALS
MATERIALS CONSULTATION
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