Integrating contractile cardiac tissues with multielectrode arrays (MEA) via elastic, 3D printed micro-scaffolds and bioprinting.

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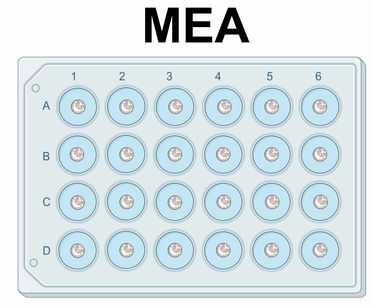
1: Tailored Materials And Tissues (TMAT) , DTU Health Tech

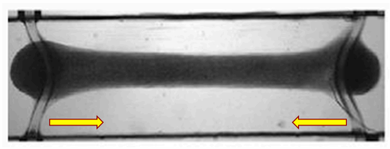
2: Applied Stem Cell (ASTEM) , DTU Health Tech

	MEA	EHT
Tissue Delamination	YES	NO
Long Term Culture	✗	✓
Tissue Organization and Architecture	✗	✓
Tissue Maturation	✗	✓
Action Potential (AP) Recording	✓	✗
High Throughput	✓	✗

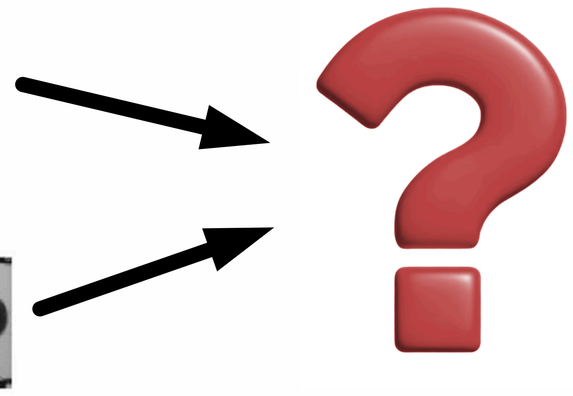
A need to find a new platform to study arrythmias

MEA





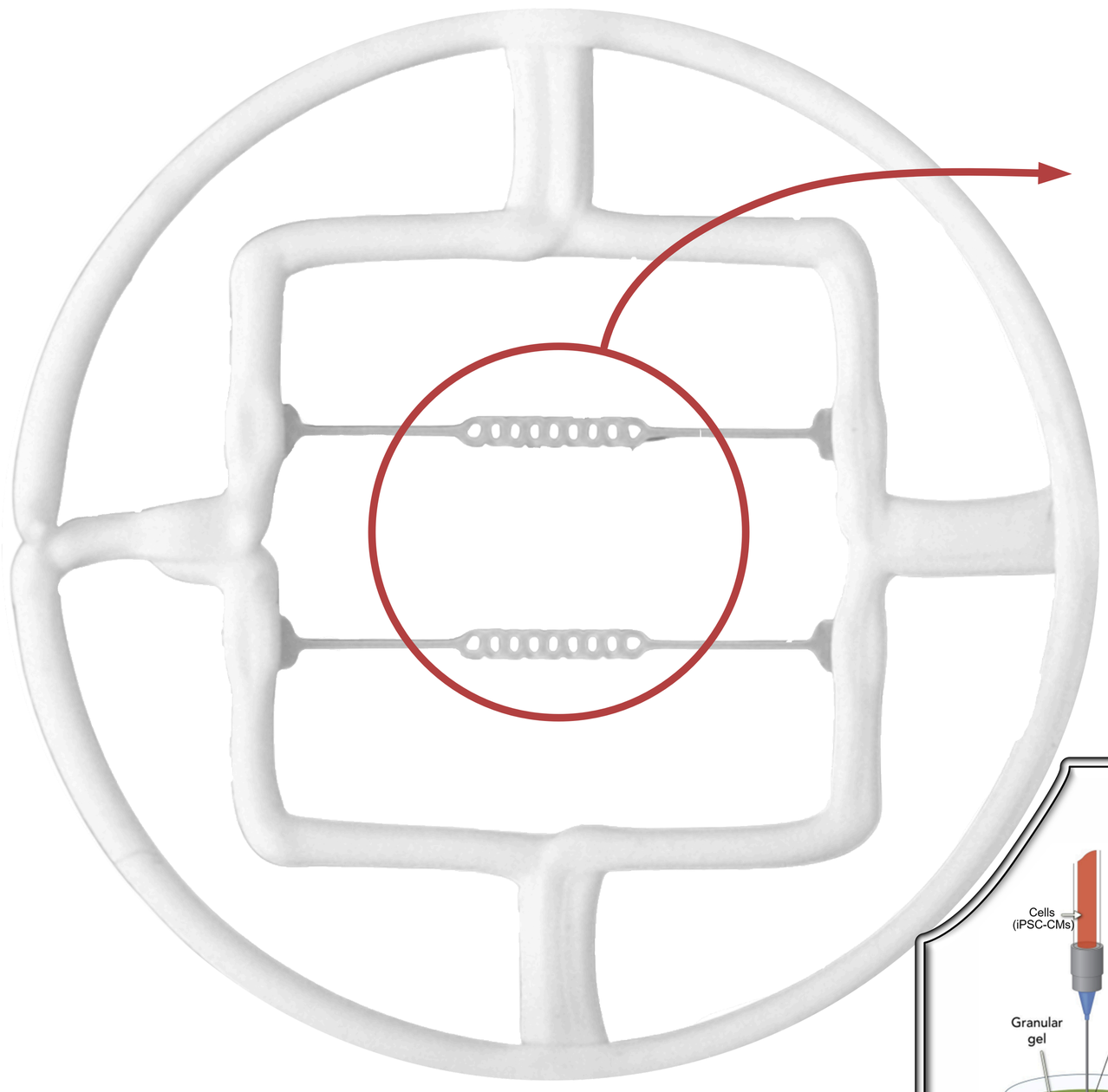
EHT*



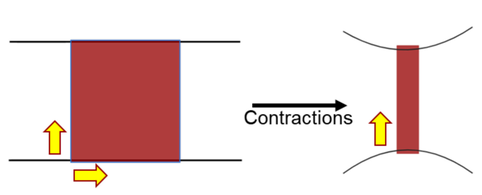
***Engineered Heart Tissue (EHT)**

The Frame

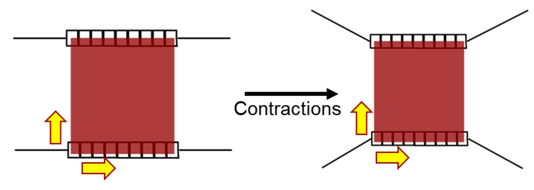
Tailored and removable device placeable on MEA



Porous Structure : Why a Porous Structure ?



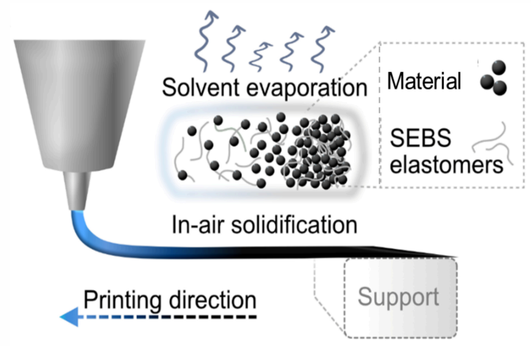
Linear Structure : Tissue loses structure. AP recorded unidirectionally.

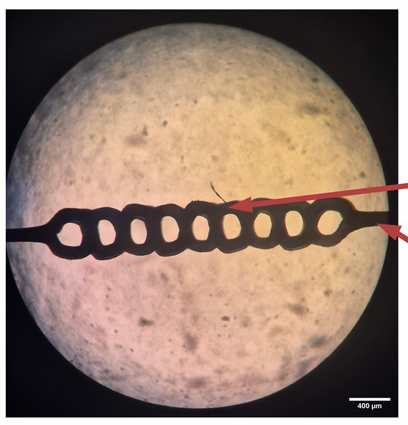


Porous Structure : Tissue keeps structure. AP recorded bidirectionally.

Method :

In-air-pritning using **37% SEBS + SPHERILEX**. Made of 5 layers (total height 0.4 mm).

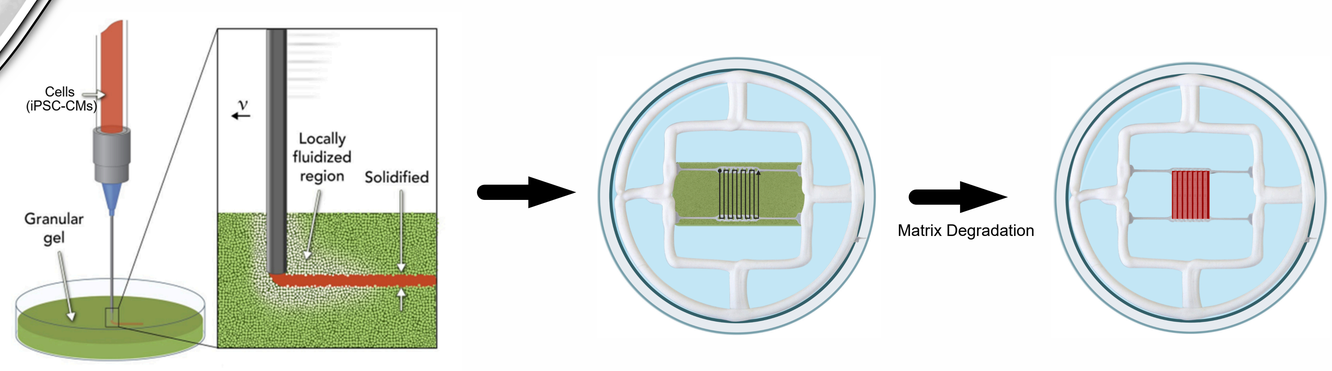




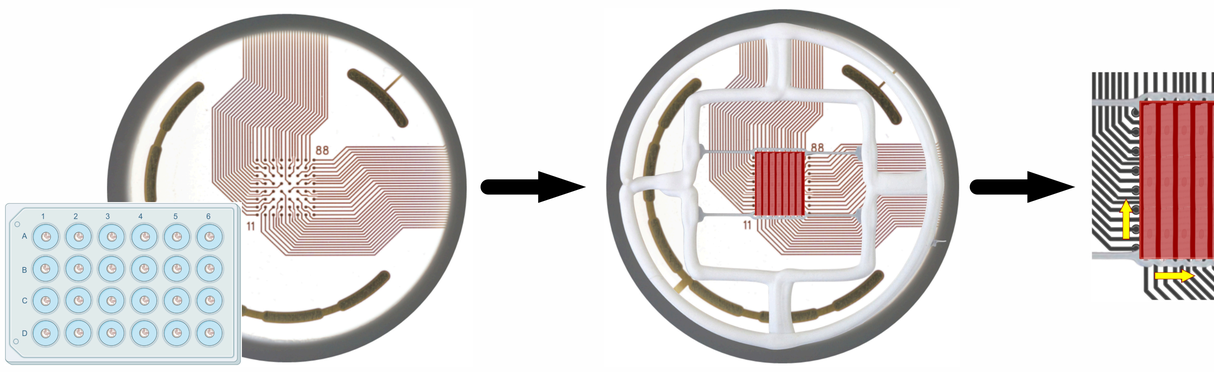
Porous structure. **Stiff,** so it does not bend. The cells attach here.

Linear structure. **Flexible** part. Allows for tissue contraction without breakage.

Embedded Bioprinting



Allows us to record electrical signals from EHTs on MEAs



- **Recording** and **studying** electrical signals at **any time of the culture.**
- Create more **detailed** and **tailored tissue** : mimic *in-vivo* conditions of the myocardium.



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