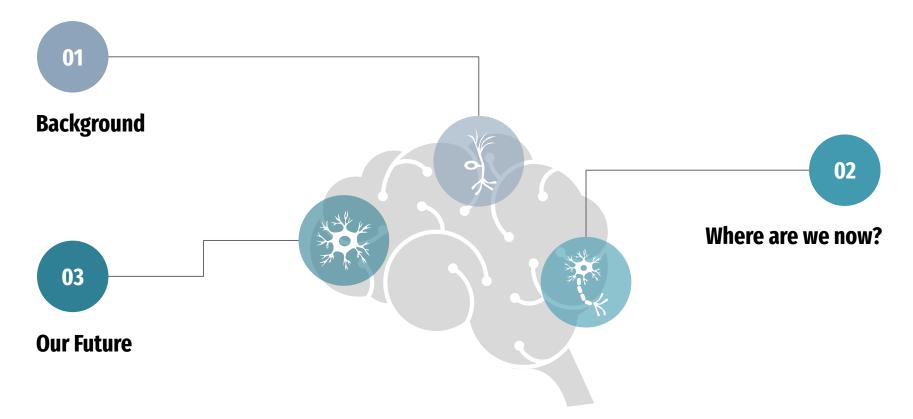


Development of Bioelectronic Scaffolds for Hybrid Brain Tissue

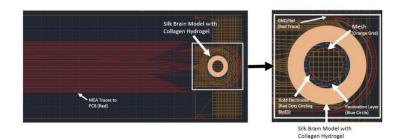
Zainab Olushoga, Diamond Mensah, Enrique Rodriguez PI / Mentor(s): Dr. Brian Timko, Dr. David Kaplan

Presentation Outline

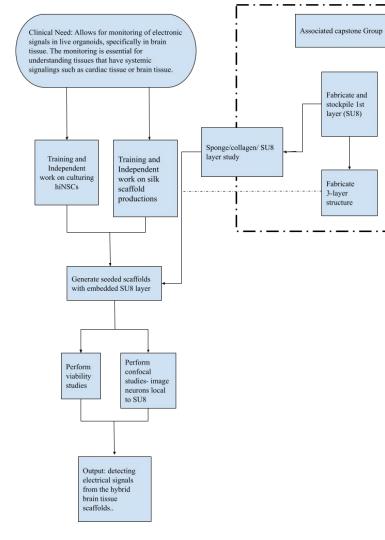


Background

- Flexible Bioelectronics that have been shown to successfully measure electrophysiology of live tissues.
- 3D brain model using silk fibroin seeded with iNSCs, functional model of brain tissue.
- Combining these two, components into one results in novel hybrid brain tissues that are able to provide stable longterm readouts of neuronal/tissue function.



Schematic detailing Hybrid Tissue set up (Cote, 2022)



- Calcium AM (Viability F4)
- Beta Tubulin 3 assay (network density + visibility)
- Live-Dead (T.F.)

Where are we now?

- Imaging mature scaffolds for evaluate network density and visualization
- Training in Clean Room + BioES Fabrication
- Rebuilding cell culture and scaffold stock after initial loss

Future Plans

Aims	Sub-aims	Progress (%)	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15
Tissue Engineering Component													1				
	Create Silk Brain Scaffold	100%															
	Order Cell Culture Materials	90%															
	Neuron Culture and Differentiation	0%															
	Scaffold & Culture Integration	0%															
Electronic Device Component																	
	Order Materials	0%															
	Fabricate and Stockpile Sacrificial Layer	0%															
	Fabricate and Stockpile Base Passivation Layer	0%															
	Fabricate and Stockpile Top Passivation Layer	0%															
Integration																	
T.E and E.D Component	With Cells	0%															
	Without Cells	0%															
	Detect Electronic Signals	0%															
Analysis																	
	Sponge/collagen/ SU8 layer study	0%															
Perform viability studies	Thermo Fisher Live Dead Assays	0%															
	Calcium Assays	0%															
	Perform confocal studies- image neurons local to SU8	0%															

Questions?

Visit Our Website:

https://sites.tufts.edu/hybridbraintissue/