

Intracranial EEG Phantom for Brain Stimulation Studies

Date: 10/16/2025

Client: Dr. Raheel Ahmed

Alternative Contact: Dr. Arun Karumattu Manattu

Advisor: Dr. Paul Campagnola

Team:

Avery Schuda (*Team Leader*)

Lilly Mackenzie (*Communicator*)

Helene Schroeder (*BSAC*)

Orla Ryan (*BWIG*)

Corissa Hutmaker (*BPAG*)

Problem statement

Intracranial electroencephalography (iEEG) is routinely used in surgical planning for individuals with uncontrolled seizures. Transcranial magnetic stimulation (TMS) may provide complementary information for mapping out critical brain regions that should be avoided during surgery, however, there are still safety concerns around the use of TMS in patients with iEEG. The major safety concerns are the induction of electrical currents, heating, and displacement of the implanted electrodes. The goal of this project is to develop a phantom that can be used to simulate the effect of TMS on electrode currents, temperatures, and changes in position.

Brief status update

This week the team completed the preliminary report. The team has also made progress in creating testing protocols and inquiring about the equipment available within the university.

Difficulties / advice requests

Major team goals for the next week

1. Order agar for hydrogel
2. Meet with Dr. Ahmed for further project information
3. Plan testing on the rheometer
4. Inquire further about testing methods for thermal conductivity

Next week's individual goals

- Avery
 - Meet with client and med student to update progress and discuss next steps for the project
 - Gather materials needed to execute testing protocols
- Lilly
 - Order materials and determine gel composition/additives
 - Meet with client to clarify points on project
- Helene
 - Meet with Dr. Ahmed and the team to discuss next steps in the project
 - Finalize materials and protocols for the fabrication of the hydrogel
- Orla
 - Continue to keep website updated as more deliverables are created
 - Prioritize testing protocols and a plan for show and tell in two weeks
- Corissa
 - Send initial materials to Dr. Ahmed for ordering
 - Begin Minitap simulations while waiting for hydrogel to arrive

Timeline

[illegible]

Category 2										
									\$0.00	
									\$0.00	
								TOTAL:	\$0.00	