W.L. Gore & Associates Senior Capstone Project Proposal

August 2020

Title: Bioelectric Generator

Information on Project Sponsor:

At W. L. Gore & Associates, our products are designed to be the highest quality in their class and revolutionary in their effect. We resolutely live up to our product promises, and our associates address technical challenges with innovative, reliable solutions.

Our fluoropolymer products provide innovative solutions throughout industry, in next-generation electronics, for medical products, and with high-performance fabrics. We've repeatedly been named among the "100 Best Companies to Work For," in the U.S. by FORTUNE magazine, and our culture is a model for contemporary organizations seeking growth by unleashing creativity and fostering teamwork.

While we may be best known for our GORE-TEX® fabrics, all our products are distinguished in their markets. Our technologies and fluoropolymer expertise are unsurpassed.

We create next-generation cable assemblies and components for the electronics industry, set the standard for outerwear comfort and protection, solve difficult industrial problems with innovative materials and technology, and Gore medical products work in harmony with the body's own tissues to restore normal body function.

Scope of Work:

The scope of this project is to design, build, and test a fully implantable electric generating / charging system designed to recharge pacemaker type implants to prevent the need for surgical battery replacement.

Overall Requirements:

1. Safe per ANSI, OSHA, or other related safety standards.
2. Develop, justify, and characterize the following attributes (recommended but not limited to):
    - Charge Rate requirements
    - Allowable Size
    - Implant Materials
    - Implant Location
    - Biocompatibility
    - Power output
3. Determine and build a prototype demonstrating it meets your input requirements from section 2
4. Additional considerations
    - Wireless communication with the implant
        - Charge Level
        - Charge Rate

Desired Engineering Major: Electrical Engineering (4-5 students)

Budget:

$2,000[1] to cover the cost of:

- Documentation (reports, presentation boards, etc.)
- Materials for testing and prototyping
- Construction of multiple working models

Deliverables: Detailed literature review, project proposal, and final report, all engineering analysis, cost estimate to duplicate, bill of materials, drawing package (if applicable), software files (if applicable), all receipts for purchases/expenses, 1 fully functional prototype for demonstration.

Onsite Gore Presentation: The team will be invited to visit a W.L. Gore facility and present their project to the technical community at W.L. Gore.

[1] 1500 from Gore plus 500 from NAU.