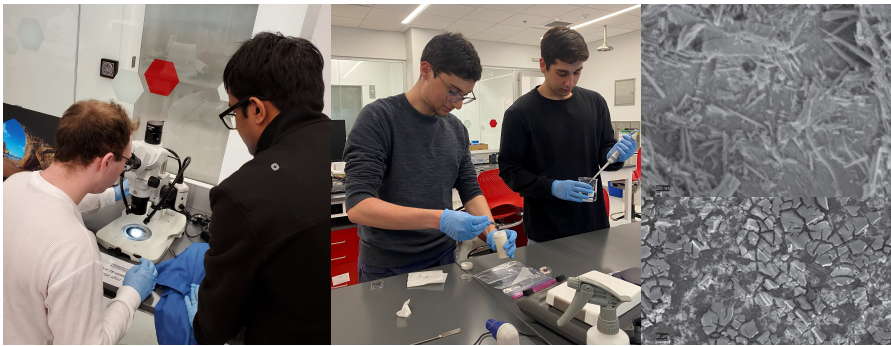




Boston University College of Engineering

## BTEC PROJECT HIGHLIGHT

### Project Javelin - Titania Nanorods



Christopher Coco, Andrew Finebaum, Christo Pulickal,  
Tomer Kushner (BME '23)

Bacterial biofilms can develop in osteoporotic patients who have undergone spinal fusion, causing the loosening of pedicle screws which can lead to infection. Previous studies have demonstrated the ability of nanorods to puncture and inhibit adhesion of bacterial biofilms. Under the supervision of David Bealka at DePuy Synthes, we sought to create, for the first time, this nanorod topology on an implantable metal surface, a titanium substrate. Post-synthesis, we utilized scanning electron microscopy to resolve nanorod characteristics. In BTEC, we ultrasonically cleaned our metal substrates and developed our titanium precursor solution. Additionally, we utilized the fluorescence microscopy and optical microscopy technology to initially resolve macroscale characteristics. The wet lab and imaging technology available at BTEC were integral to the success of our project. Our results open up the possibility for implementation of these altered substrates in in-vivo murine orthopedic models to characterize their antibacterial efficacy.

#### BTEC Advisory Board Members:



## upcoming events

**BTEC**  
ENTREPRENEURSHIP  
SEMINARS

An Evening of Networking:  
Women Leaders in Science

Apr 26 at 6, RKC-101

**BTEC x BMES**  
Design Competition

Apr 29 at 12, LSE-B03

Sponsored by Merck



Senior Design  
Day

May 5 at 10,

Photonics Center

2023 BIOMEDICAL ENGINEERING



**BTEC**  
ENTREPRENEURSHIP  
SEMINARS

Lessons Learned From  
a Career in Biotech



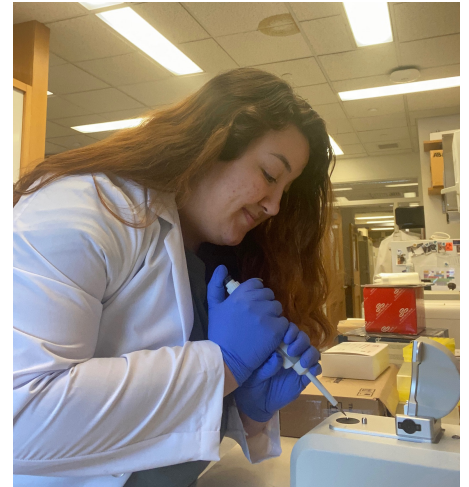
May 10 at 3:30  
RKC-101

Jo Viney, Ph.D.  
CEO  
Seismic Therapeutic

# BTEC ASSISTANT HIGHLIGHT

## Olivia Lewallen (BME '23)

Olivia has been working in BTEC since Fall 2021. Coming from a background in the arts as a painter, vocalist, and musician, with a strong love for science, she knew that engineering would allow her to perfectly combine her passions, by providing a creative outlet rooted in scientific and mathematical principles. While working at BTEC, she has helped develop demonstrations for laboratory equipment, aided student groups in their projects, assisted in event planning, and helped launch the BTEC newsletter. At BU, Olivia has found a calling for product design, prototyping, and research & development.



# SILAB TECHNOLOGY HIGHLIGHT

## Vinyl Cutter and Sewing/Embroidery Machine

SILab has expanded its materials capabilities to include fabric by adding a vinyl cutter and a sewing/embroidery machine. With the vinyl cutter students can fabricate precise designs out of vinyl, paper, and fabric. The sewing/embroidery machine will make experimenting with designing fabric-based wearable devices (e.g., gloves, backpacks), parachutes, sails, etc. more accessible. A variety of materials including nylon, polyester, and other synthetic polymers up to 6mm thick can be used.



# SILAB ADVISOR HIGHLIGHT

## Richaa Kalva (BME '23)

Richaa has been working at SILab since Fall 2021, though her passion for woodworking and machining began with FIRST robotics in high school. In SILab Richaa has built a shoe stand, desk organizers, a turntable, and a CNCed height map of her favorite region of Shenandoah National Park. For her senior design project, Richaa is working in the Wilson Wong Lab designing a programmable device capable of leveraging optogenetics to stimulate spatially and temporally controlled tissue patterning. Richaa has been using the 3D printers at SILab to design hardware for her research. Working at SILab has not only given Richaa a wealth of hands-on experience, but has also connected her with many inspiring engineers at BU!



# PAST EVENT HIGHLIGHTS

## BTEC Tech Workshops

BTEC Tech Workshops are open to all undergraduate and graduate students who are interested in gaining practical skills and knowledge related to bioengineering technologies. In the **Gel Electrophoresis workshop**, students worked in teams to make agarose gels from scratch and analyze their results on the iBright Gel Imager. This led to a lively discussion amongst the students about which classes, research positions, and internships would build on their new skills.

In the **AI/ML workshop**, over 25 students learned the basics of Deep Learning and Neural Networks and how a complex algorithm like ChatGPT might be developed. Students coded and generated their own neural network models to analyze a dataset of over 4000 images to classify diseased vs. healthy chest x-rays.



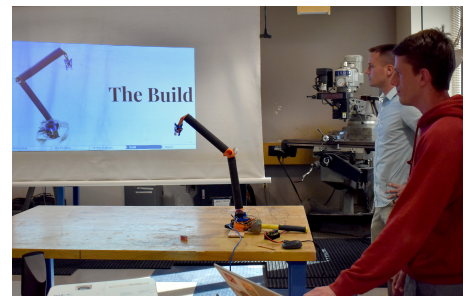
## Lutron Lighting Innovation Competition

The Lutron Lighting Innovation Competition took place at SILab February 18. Eleven teams entered and were judged on creativity and build quality. The winning project, **Write-a-Light** by **Yash Patel (BME '25)**, **Melissa Ferranti (CE '25)**, **Kara Walp (BME '24)**, and **Abby Smith (BME '25)** was a functional LED "Etch-A-Sketch".



## 9<sup>th</sup> Annual Dean's Imagineering Competition

This year-long design competition gives students the opportunity to express their creativity and entrepreneurial capabilities on ideas that impact people and society. Six teams brought their designs to the final stage of the competition. The first place winners were **Noah Jones and Tiaan Spies (RAS '24 MS)** with their project **CARL: a Creative Arm for Robotic Learning**. CARL is an inexpensive full sized robotic arm that can be used to teach children of all ages about robotics and programming through hands-on experiences. The second place winner was **Peng Qiu (ECE '24)** with his project **BU Planner X**, a program that can rapidly help BU students select which courses they should register for based on time and professor preferences.



Diane Joseph-McCarthy, Executive Director BTEC  
Kavon Karrobi, BTEC Manager  
Katie Kelso, SILab Manager  
For more information, email: [btec@bu.edu](mailto:btec@bu.edu)