



Boston University College of Engineering

## BTEC PROJECT HIGHLIGHT

### Nanoparticle Drug Detection Device for Spiked Drinks



Melissa Ferranti (ECE '25), Kara Walp (BME '25), and Yash Patel (BME '25)

There is a lack of accessible, commercially available point-of-care “date-rape” drug detection devices. For the 2022-2023 BTEC x BMES Design-a-Thon, we developed a portable lateral flow assay that detects gamma-hydroxybutyric acid (GHB, one of the most common date-rape drugs) with a colorimetric mechanism. The design involves silver nanoparticles (AgNPs) that are bifunctionalized with two ligands that induce nanoparticle (NP) agglomeration in the presence of GHB. The agglomeration induces a red shift in the localized surface plasmon resonance of the NPs. The prototype utilizes Trisodium-Citrate capped AgNPs to detect low levels of HCl as a proof of concept for the design. At BTEC, we executed our prototype from NP synthesis to NP characterization utilizing state-of-the-art equipment. We used the Anton-Paar’s Litesizer to measure NP surface potential and size, metrics that are indicative of the quality of NP and correlate with the color of light reflected. Additionally, we used an array of spectroscopy equipment to directly measure the colorimetric detection mechanism.

#### BTEC Advisory Board Members:



DRAPER



## upcoming events

BTEC x BMES Design Competition Kickoff  
Sept 28 at 6:30, BTEC 201



BTEC

ENTREPRENEURSHIP SEMINARS

### Biomedical Innovations of the Future Symposium

Oct 19 at 1:30, CDS 17<sup>th</sup> floor



Keynote Speaker:

Tejal Desai

Sorensen Family  
Dean of Engineering

Brown University

### HackHardware Workshop

Oct 21 at 3, BTEC 201

### Dean’s Imagineering Competition Kickoff

Oct 27 at 4, SILab

Catapult Competition  
Nov 18 at 12, Nickerson



BTEC

ENTREPRENEURSHIP SEMINARS

Corin Williams, Draper

Dec 6 at 3:30, CDS 1750

# SILAB TECHNOLOGY HIGHLIGHT

## Laser Engraver and Cutter

Laser engraving and cutting machines allow you to cut out and engrave materials, such as acrylic, wood, paper, and fabric, rapidly and to precise CAD specifications. The new Epilog Fusion 24Pro at SILab can cut materials that are up to 2 feet wide/long and 3/8" thick. The technology focuses high-powered lasers with optics to enable rapid, precision prototyping of complex projects at scale in an automated fashion.



# BTEC ASSISTANT HIGHLIGHT

Greg Molina (MSE '23)



Greg has been working in BTEC since Fall 2022. He came to BU with an undergraduate degree in Chemistry and years of industry experience as a synthetic organic chemist. At BU, Greg is earning a masters degree in Materials Science and Engineering working in the Jeffries-EL lab on device fabrication and materials characterization. As a BTEC assistant, Greg has gained valuable knowledge and experience with new instrumentation such as CELLINK's BIO X 3D Bioprinter, aided students with their projects, and provided industry insights to fellow BTEC assistants and users alike.

# ENGINEERING STUDENT INNOVATION FUND

Do you have a project that you are working on in BTEC/SILab that could benefit from funding for supplies?

For information on how to apply for funding scan the QR code or visit the URL below.

**Applications Now Open!**



# PAST EVENT HIGHLIGHTS

## BTEC x BMES Design Competition

The 1<sup>st</sup> annual design competition--focused on challenges in healthcare disparities and how diversity incorporated into designs can enhance outcomes--concluded at the end of April. The winning projects designed a handheld GHB detector, an imaging device to help detect colorectal cancer, and AI-based chest X-Ray diagnostic software.

## Engineering Materials in 3D Workshop

In July, BTEC and SILab held a 2-day workshop on SolidWorks 3D modeling, 3D printing, and 3D bioprinting. The workshop included a mini design challenge. Han Kahvecioglu (BME '25), Amy Cameron (BME '25), Maddie Malloy (BME '26) and Jacob Chin (BME '25) took first prize for their design of a pancreas filtering system for diabetes!

## Engineering Fabrics Workshop

In August, SILab held a workshop on combining 3D modeling skills with fabrication techniques to engineer fabric-based products. Each student walked away with a reusable bag of their design and the skills needed to create future fabric prototypes.

## Summer Outreach

The 2<sup>nd</sup> annual First Inspiration in Research in Engineering (FIRE) program took place in BTEC, introducing 25 high schoolers to engineering through robotics, 3D printing, microfluidics, miniPCR, etc.

The STEM Pathways High School Research Experience program visited BTEC; students learned about career paths in biomedical engineering, visualized proteins with molecular modeling tools, and explored the use of blood oxygenation biosensors.

## BU Biotech Group Event

BTEC sponsored the BU Biotech Group's Fireside Chat in August where Dave Freedman (Co-Founder, CEO and COO of NanoView Biosciences) and Cory Sago (Founder and former CTO of Guide Tx) discussed translating promising technology to a viable biotech.

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Kavon Karrobi, BTEC Manager  
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