



# Conference Agenda

# Conference Agenda

May 2, 2025 9:00am - 5:00pm

Track 1 PHO 206 | Track 2 PHO 203

Reception to follow at the Center for Computing & Data Sciences, Room 1750

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9:00 - 9:25 Continental Breakfast and Check-in **Atrium**

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## Track 1 - PHO 206

9:25 - 9:30 WELCOME Prof. Diane Joseph-McCarthy

*Affiliations not specified are BU BME*

### Session A

## Molecular and Synthetic Biology **PHO 206**

Session Chair: Prof. Miguel Jimenez

9:30 - 9:45 **Engineering Native Soil Biosensors for Deployable Plant Health Monitoring**

Team 24: Isabella Balian, Luca Pungan

*Advisor: Miguel Jimenez*

9:45 - 10:00 **Multicolor Optogenetic Toolbox for Spatially Patterning Mammalian Cells**

Team 29: Shea Mowry, Lucas Schaake

*Advisors: Ian Kinstlinger, Wilson Wong*

10:00 - 10:15 **Engineering Encodable Fluorogenic Probes for Screening of Protease Activity**

Team 33: Filip Pajevic, Anton Ruppert, Loena Sooch

*Advisors: Liang Hao, Megan Hopton*

10:15 - 10:30 **Advancing Wastewater Monitoring Through Engineered Biological Sensors**

Team 4: Yash Patel, Kara Walp

*Advisors: Miguel Jimenez, Rabia Tuğçe Yazıcıgil Kirby (ECE)*

10:30 - 10:45 **In Vitro Characterization & Application of DNA-Launched Self-Amplifying RNA**

Team 41: Halide Zeynep Haciguzeller, Xinrui (Stella) Liang

*Advisor: Wilson W. Wong*

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10:45 - 11:00 Coffee Break **Atrium**

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## Session B

# Biomechanics and Orthopedics 1 PHO 206

Session Chair: Prof. Brianne Connizzo

- 11:00 -11:15 Agarose Injection Device for Respiratory Research**  
Team 42: Andrew Jedrey, Takaya Niibori, Vansh Patel, Mercan Ulutas  
Advisor: Yuqing Deng, Béla Suki
- 11:15 -11:30 Probing High Frequency Ventilation Using Crystal Ribcage**  
Team 45: Han Ali Kahvecioglu, Jonathan Lee  
Advisors: Gabrielle Grifno, Hadi T. Nia
- 11:30 -11:45 A Macrofluidic Bioreactor to Recreate Hormone Fluctuations *In Vitro***  
Team 34: Bridget Gomez, Griffin Huneke, Arnav Mankad  
Advisor: Brianne Connizzo
- 11:45 -12:00 A Novel Biomedical Device to Measure Tissue Plasticity**  
Team 44: Nikita Vinay Kishan, Zhiheng Xu  
Advisors: Béla Suki, Yuqing Deng
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**12:00 -12:45** Lunch **Atrium**

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## Session C

# Computational and Digital Medicine PHO 206

Session Chair: Prof. Sandor Vajda

- 12:45 -1:00 Analysis of Binding Site Hot Spots on Antibody and Antigen Proteins**  
Team 20: Henry Chow, Marcus Kankkunen, Michel Shaker  
Advisors: Diane Joseph-McCarthy, Omeir Khan
- 1:00 -1:15 Antibody-Antigen Binding Prediction using Protein Language Models**  
Team 21: Eliot Jolley, Kenji Walker  
Advisors: Diane Joseph-McCarthy, John Misasi, Yannis Paschalidis, Sandor Vajda
- 1:15 -1:30 Developing Genomics 2 Proteins (G2P) Platform**  
Team 37: Wylliam Cheng, Carson Mo, Charles Przekop  
Advisors: Dr. Sumaiya Iqbal, Jordan Safer (Broad Institute of MIT and Harvard)
- 1:30 -1:45 Reactivating HIV-1 Latency Through HDAC3 Isoform Engineering**  
Team 38: Ishan Bhattacharjee, Dylan de Valk, Elizabeth Esquivel  
Advisor: Geoffrey Siwo (University of Michigan Medical School)
- 1:45 -2:00 Enhancing Patient Matching in Alzheimer's Trials Using Brain Pathology**  
Team 6: Siri Allegra-Berger, Ariella Blake, Emily Pira, Anjali Rana  
Advisor: David Salat (Niji Neuroscience)

## Session D

# Biomechanics and Orthopedics 2 **PHO 206**

Session Chair: Prof. Béla Suki

- 2:00 - 2:15**    **Improving Ultrasound Guided Injection Accuracy in Murine Rotator Cuffs**  
Team 25: Stephanie Linn, Elizabeth Ozimek, Alex Scott  
*Advisors: Brianne Connizzo, Hana Kalco*
- 2:15 - 2:30**    **Assessment of Rodent Movement as a Means of Evaluating Injury Recovery**  
Team 3: Sarah Kirk, Emily McCarthy, Moya Priddy  
*Advisors: Beth Bragdon, Elise Morgan*
- 2:30 - 2:45**    **Device Development for Inducing Comminuted Fractures in Mice Tibiae**  
Team 30: Rishav Roy, Maya Shah (ME), Rachel Zummo  
*Advisor: Elise Morgan*
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**2:45 - 3:00**    Coffee Break    **Atrium**

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- 3:00 - 3:15**    **Affordable Device for Measuring Mechanical Properties of ECM Fibers**  
Team 17: Nick Pham, Barrett Schenk  
*Advisors: Michael L. Smith, Katherine Yanhang Zhang*
- 3:15 - 3:30**    **Design of a Mouse Cough Detection System for Preclinical Research**  
Team 43: Aya Maria Freiha, Min Tang, Jianan Yu  
*Advisor: Béla Suki*

## Session E

# Biomaterials, Nanotechnology, and Drug Delivery

Session Chair: Prof. Tim O'Shea

- 3:30 - 3:45**    **ABT-263 Loaded Hydrogels on Aged Skin to Promote Cutaneous Wound Healing**  
Team 50: Juliana Braga, Emily Oei, Kristin Womack  
*Advisors: Katherine Hohl, Daniel Roh (Boston Medical Center, BU School of Medicine)*
- 3:45 - 4:00**    **Targeted Delivery of PTX via Focused Ultrasound in Murine Ovarian Cancer**  
Team 15: Kathryn Banish, Abduelrahman Fahmi, Carolyn Glasener  
*Advisor: Dr. Seung-Schik Yoo (Mass General Brigham/Harvard Medical School)*
- 4:00 - 4:15**    **Cellulose-based Antibacterial Coatings to Prevent Medical Device Infection**  
Team 28: Jacob Labovitz, Ananya Pamaraj, Lakshmi Rajesh  
*Advisors: Eric Dubois, Timothy O'Shea*
- 4:15 - 4:30**    **Designing Aptamer-Containing Nanostructures to Drive Immune Cell Interactions**  
Team 39: Julia Nowak, Meghan Pinter  
*Advisor: Michelle Teplensky*

## Track 2 - PHO 203

9:25 - 9:30 WELCOME Prof. Darren Roblyer

### Session A

## Neuroengineering 1 PHO 203

Session Chair: Prof. Matthias Stangl

- 9:30 - 9:45 **MATLAB Simulation of Neuron Responses to Barriers**  
Team 35: Anthony Dupio, Everett Guermont, Stefan Meier, Kyle Xu  
*Advisor: Michael Hasselmo (Center for Systems Neuroscience)*
- 9:45 - 10:00 **Auditory Spatial Encoding: Motorized Rail System for Auditory Experiments**  
Team 46: Rita Aoun, D'angelo Flores, Jack Hutchison, Kevin Silva  
*Advisor: Kamal Sen*
- 10:00 - 10:15 **Evaluating the Efficacy of Cognitive Therapy Using fNIRS Hyperscanning**  
Team 11: James Colwell, Joseph Licata, Grace Magee  
*Advisors: David Boas, Swathi Kiran*
- 10:15 - 10:30 **Multimodal Toolbox to Investigate Neurodevelopmental Disorders in Brain Organoids**  
Team 2: Julia Andrist, Sophia Ehrhardt  
*Advisor: Martin Thunemann*
- 10:30 - 10:45 **Integrated Multi-Sensor Framework for Real-World Human Data Acquisition**  
Team 23: Anvitha Nekkanti, Delaney Pendleton  
*Advisor: Matthias Stangl*

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10:45 - 11:00 Coffee Break **Atrium**

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### Session B

## Neuroengineering 2 PHO 203

Session Chair: Prof. Michael Economo

- 11:00 - 11:15 **Automated Arena to Evaluate Rat's Physical Prediction and Surprise Reaction**  
Team 7: Laura Colón, David Fang, Mingshan Guo, Landon Smith, Eugene Xiong  
*Advisor: Benjamin Scott (Psychological & Brain Sciences)*

- 11:15 -11:30 Real-Time Estimation of Hand Position and Configuration Using Deep Learning**  
Team 47: Neysa Dadhi, Mincheol Kim, Amanda Kopelman  
*Advisor: Chandramouli Chandrasekaran (Boston University School of Medicine)*
- 11:30 -11:45 Implementation of Machine Learning Algorithms for Analysis of Connectomes**  
Team 1: Nathan Lee, Justin Li, Logan Li, Michael Waetzman  
*Advisor: Jerry Chen (BU Biology)*
- 11:45 -12:00 Transcranial Ultrasound Treatment in Alzheimer's Disease 5xFAD Mice Model**  
Team 14: William Carroll, Anvita Reddy  
*Advisor: Seung-Schik Yoo (Harvard Medical School, Brigham & Women's Hospital)*
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**12:00-12:45** Lunch **Atrium**

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### Session C

## Devices PHO 203

Session Chair: Prof. Kamal Sen

- 12:45 -1:00 BUzz Bracelet: Alerting Users With Hearing Loss to Auditory Dangers**  
Team 9: Oscar Locatell-Harris, Mohamed Mohamed (CE), Sayed Mohamed (ME), Reda Samari, Bharath Venkatesan  
*Advisor: Kamal Sen*
- 1:00 - 1:15 Whisper to Words: AI-Powered Speech Therapy Application**  
Team 13: Tilila El Baissi, Andrea Lugo Sanchez, Maiko Lum, Joscelynn Palen  
*Advisor: Andrey Vyshedskiy (ImagIRation)*
- 1:15 -1:30 Developing a Cost-effective, Disposable Cartridge Integrated with SP-IRIS**  
Team 49: Andrew Wang, Linghui Yang  
*Advisor: Selim Ünlü (ECE)*
- 1:30 -1:45 Flexible, Fluidic-Actuated Soft Robotic Aspirator for Blood Clot Removal**  
Team 19: Melissa Ferranti (CE), Nick Morris (ME), Abby Smith, Kara Stratton (EE)  
*Advisor: Kenneth Sebesta (ME)*

## Session D

# Optics PHO 203

Session Chair: Prof. Irving Bigio

- 1:45 - 2:00 Compact Skin Tone Colorimeter for Application in Optical Imaging**  
Team 22: Shripreetika Guruprasad, Jackson Muise, Emma Stone  
*Advisors: Kavon Karrobi, Darren Roblyer*
- 2:00 - 2:15 Portable Oximeter for Accurate SpO<sub>2</sub> Across Diverse Skin Tones (Phase 2)**  
Team 48: Emma Chesley, Alexandre Ribas, Arianna Rodriguez, Azul Pieropan Sanchez  
*Advisors: Ousama A'Amar, Irving Bigio, Stephen Pittman (Apnimed, Inc)*
- 2:15 - 2:30 Removing Motion Artifacts In Speckle Contrast Optical Spectroscopy (SCOS)**  
Team 40: Timothy Francisco, Isaiah Raghubar, Victoria Travnik, Dan Vu  
*Advisors: Ariane Garrett, Darren Roblyer*
- 2:30 - 2:45 In Vivo Nanoscale Ultrasound Imaging of the Microbiome**  
Team 27: Haven Cook (ECE), Joshua Korb, Ethan Rapa, Edward Wei (ECE)  
*Advisors: Nikunj Khetan, Jerome Mertz*

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**2:45 - 3:00** Coffee Break **Atrium**

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## Session E

# Biosensing and Tissue Engineering PHO 203

Session Chair: Prof. Erica Pratt

- 3:00 - 3:15 Two-Port Olfactometer to Evolve Mosquito Host Preference Away from Humans**  
Team 10: Emily Dang, James Decker, Camila Mejia, Sarah Park  
*Advisors: Meg Younger (Biology), Yifan Wang*
- 3:15 - 3:30 Validation and Stability Testing of Surface Modifications on PDMS via FTIR**  
Team 16: Annelisa Faché, Sasha McLeod, Vittoria Sama  
*Advisors: Christine McKee, Joyce Wong*
- 3:30 - 3:45 Fluorescence Imaging of Nanoparticle-Treated Tumor Cells in Microfluidics**  
Team 26: Danielle Beason, Jian Knight (ME), Namanjot Singh, Yuei Taou Lee  
*Advisors: Alex Markoski, Jeffrey Borenstein (Draper)*

**3:45 -4:00 Antifibrotic Drug Delivery in Tissue Expanders for Post Mastectomy Patients**

Team 36: Sarah Hanifin, Savanna Jacovini, Isabella Turolla

Advisor: Daniel Roh (Boston Medical Center)

**4:00 -4:15 A Low-Cost Device for Bioluminescence Imaging**

Team 18: Evan Horvath, Zain Jafri, Cal Parise

Advisor: Zeba Wunderlich (Biology)

**4:15 -4:30 Soft Layer-Jamming Medical Device for Compression Therapy**

Team 12: Samer Berghol, Kaushik Jasti, Johann Pang, Aric Peng (ME),  
Abderrahman Rhmari Tlemcani

Advisor: Andrew Sabelhaus (ME)

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**4:30 -5:00 Awards and Closing Remarks PHO 206**

Prof. Diane Joseph-McCarthy, Prof. Darren Roblyer, Prof. John White

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## Projects Previously Presented

*Projects containing confidential information (private presentations)*

**Phantom Fluid-Based Calibration Framework for the iCoagLab Device**

Team 5: Abigail Dereje, Riju Sinha, Elizabeth Yamnitsky, Srirupa Yerramsetti

Advisors: Aniket Joshi (Coalesenz Inc.), Brian Koker (Coalesenz Inc.), Shane Ward (Coalesenz Inc.)

**Development of Spore: An At Home Mold-Monitoring Device**

Team 8: Brice Cerar, Adrian Reyes, Andres Santillan-Gonzalez, Eileen Solomon, Mark Tannoury

Advisors: Andrea Crewe (Vitaliti), Lindsey Dotson (Vitaliti), Zarah Lakhani (Vitaliti)

**A High-throughput Petri Dish-Based Organ-on-a-Chip with Perfusion System**

Team 31: Xiaolei Song, Winita Wangsrikhun

Advisors: Christopher Chen, Terry Ching

**Unraveling Cellular Treatment Effects from Drug-Response Genomics Screens**

Team 32: Isha Mukundan, Sabrin Sefa

Advisors: Matt Kanke (Amgen), Chun Su (Amgen)