

Conference Agenda

May 3, 2024 9:30am - 4:30pm

Track 1 PHO 206 | Track 2 PHO 203

Reception to follow at the Hotel Commonwealth

9:30 - 10:00 Continental Breakfast and Check-in **Atrium**

Track 1 - PHO 206

Affiliations not specified are BU BME

10:00 - 10:05 WELCOME Prof. Diane Joseph-McCarthy

Session A

Biomechanics PHO 206

Session Chair: Prof. Michael Smith

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10:05 - 10:20	Investigating Sex-Dependent Differences in Tensional Homeostasis Team 17: Diya Desai, Josephine Dunphy, Nourhan El Sherif, Marin Perez, & Sabrina Wilderotter <i>Advisors: Brianne Connizzo, Michael Smith</i>	27
10:20 - 10:35	Design and Fabrication of A Novel Negative Pressure Ventilator for Mice and Large Animals Team 9: Jung Won Park <i>Advisor: Hadi T. Nia</i>	
10:35 - 10:50	Translation of a Novel Microstructured Tissue Fastener into a Coronary Stent Team 25: Isabelle Nguyen, Marianne Palmieri, Mark Ruta, Vrishin Sundaram and Nicole Zajac <i>Advisors: Peyton Fitzgerald, Joseph Urban and Corin Williams (Draper)</i>	28
10:50 - 11:05	Design of an Improved Optical Measurement Method for Spinal Deformation in Spinal Metastatic Disease Team 37: Massimo Siracusano, Teluck Sharma <i>Advisor: Ron Alkalay (Department of Orthopedic Surgery, Beth Israel Deaconess Medical Center)</i>	29

11:05 - 11:20	Engineering Functional Recovery of Hyperproliferative Hepatocytes for Implantable Liver Grafts	30
	Team 16: Veronica Hui, Chi (Jeffrey) Li	
	<i>Advisors: Amy Stoddard, Delaney Gray-Scherr, Christopher Chen</i>	

11:20 - 11:40 Coffee Break **Atrium**

Session B

Digital and Predictive Medicine **PHO 206**

Session Chair: Prof. Brian DePasquale

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11:40 - 11:55	Computational Investigation of PFAS Molecules Binding to Human Fatty Acid Binding Protein	33
	Team 13: Billy Zhai, Chunlin Zhu, Prakruti Dholiya	
	<i>Advisors: Diane Joseph-McCarthy, Joyce Wong</i>	
11:55 - 12:10	Building Computational Framework to Better Research on Cancerous Spinal Strength and Integrity	34
	Team 20: Ismail Sufi, Natalie Will	
	<i>Advisor: Ron Alkalay (Center for Advanced Orthopedic Studies Beth Israel Deaconess Medical Center)</i>	
12:10 - 12:25	Scoring the Druggability of Proteins Based on Results of Advanced Protein Prediction Tools	35
	Team 29: Sulaiman Alsalamah, Madelyn Keller, Sydney Sorbello	
	<i>Advisor: Sarah Spencer (Novartis)</i>	

12:25 - 1:15 Lunch **Atrium**

1:15 - 1:30	Innovative Strategies in Venous Blood Collection: iCoagLab's Vision for Minimally Invasive and Enhanced Care	36
	Team 21: Victoria Gonzalez Canalle, Noelle Flanagan, Zoe McCarthy, Jessica Spada, Melina Teguis	
	<i>Advisor: Aniket Joshi (Coalesenz)</i>	
1:30 - 1:45	Image signal processing for quantification of microvascular tissue damage in Alzheimer's disease	37
	Team 27: Olivia Border, Rose Coviello, Victoria Rodriguez	
	<i>Advisors: Barnaly Rashid, David Salat (Niji Neuro Corp)</i>	
1:45 - 2:00	Investigation of Weakly Supervised Multi-label Image Classifier for Microscopy Image Representation	38
	Team 28: Jen Hsin Chiao, HyoJoo Kim, Sunni Lin, Susan Zhang (ECE)	
	<i>Advisors: Chien-Cheng Shih, Minhua Qiu (Novartis Institute for Biomedical Research)</i>	

2:00 -2:15	Parent University for Language Team 15: Tanner Armstard, Evan Kwong, Christian Montoya, Jane Yoo <i>Advisor: Andrey Vyshedskiy</i>	39
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Session C

Cell and Tissue Engineering **PHO 206**

Session Chair: Prof. Michelle Teplensky

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2:15 -2:30	A Novel Method to Synthesize PET Nanoparticles and Measure Their Uptake in Edible Plants Team 35: Bharat Bandi, Ishika Mehta, Navya Shetty, Shantanu Vaid <i>Advisor: Joshua Kays</i>	43
2:30 - 2:45	Aptamer Nanostructures as Adenocarcinoma Immunotherapeutics Team 8: Yulianna Estrada, Siyuan Li <i>Advisor: Michelle Teplensky</i>	44
2:45 -3:00	Nanoparticle-Chemotherapy Testing in Microfluidics Model of the Tumor Microenvironment Team 24: Ahona Dev, Dilek Aylin Manav, Sharani Nasankar, Athena Wang <i>Advisors: Jeffrey Borenstein, Alex Markoski (Draper, Brown University)</i>	45

3:00 -3:15 Coffee Break **Atrium**

3:15 -3:30	Modeling a Nanomagnetic Culturing System for Uterine Fibroid Organoids with MCF-7 Spheroids Team 2: Ricardo Fernandez, Anika Joglekar, Fernando Ortiz, Abbigale Shi <i>Advisors: Catherine Klapperich, Lena Landaverde</i>	46
3:30 -3:45	Improving Throughput in the Geometric Viability Assay to Measure Bacterial Growth Team 6: Aidan Chan, Chris Chan, Andrew Chang, Youssef Haider, Sungmin Hwang <i>Advisor: Mary Dunlop, Owen O'Connor, Eric South</i>	47
3:45 -4:00	Development of Bioprinting Techniques for Manufacturing Skin/Tumor Models Team 22: John Carlson, James Coleman, Reina Dreyer <i>Advisor: Seung-Schik Yoo (Brigham and Women's Hospital/Harvard Medical School)</i>	48

Track 2 - PHO 203

10:00 - 10:05 WELCOME Prof. Darren Roblyer

Session A

Neuroengineering PHO 203

Session Chair: Prof. Timothy O'Shea

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10:05 - 10:20	High-intensity and High-frequency Transcutaneous Electric Nerve Stimulation for Pain Management	51
	Team 5: Anna Kawai, Kelly Lam, Grace Lange, and Nik Swanson Advisors: Ezra Cohen, Eric Hazen, Kavon Karrobi, and Rishi Vaidya	
10:20 - 10:35	Glyco-nucleoside Supramolecular Hydrogels for Glia Repair	52
	Team 7: Christian DiMatteo, Manal Alshamrani, and Mohammed Alwelyee Advisor: Timothy O'Shea and Eric DuBois	
10:35 - 10:50	Classifying Human Gait Features with Machine Learning	53
	Team 4: Jiahe Niu, Xiang Yuan Advisors: Xue Han, Hua-an Tseng, Erynne San Antonio	
10:50 - 11:05	Automated Analysis of Neural Activity in Down Syndrome Using Ca^{2+} Imaging in Human Cortical Organoids Derived from Induced Pluripotent Stem Cells (iPSCs)	54
	Team 1: Hang Yang, Wuyi Zhang Advisors: Christopher V Gabel, Ella Zeldich (BU Chobanian & Avedisian School of Medicine)	
11:05 - 11:20	Speech Interactive Therapy App for Children with Autism	55
	Team 32: Emre Karabay, Raghavan Ramaswamy, Jeffrey Gao, Will Gardner, Nefeli Andreades Advisor: Andrey Vyshedskiy	

11:20 - 11:40 Coffee Break **Atrium**

Session B

Optics PHO 203

Session Chair: Prof. Irving Bigio

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11:40 - 11:55	Design and Implementation of a Portable Oximeter for Accurate Measurement of Oxygen Saturation Across a Wide Range of Skin Pigmentation	59
	Team 10: Bernadelle Boateng, Maya Frazier, Jenna Ludvigsen, and Arya Padalkar Advisors: Ousama A'Amar, Irving Bigio, Stephen Pittman, and Andrew Wellman (Apnimed, Inc and Sleep Disordered Breathing Lab at Brigham & Women's Hospital)	

11:55 -12:10	Elastic Scattering Spectroscopy: A Promising Approach Towards Stratifying Melanin Team 18: Ethan Bosworth, Maks Levin, Tyler Sanabria, Arjavi Vyas, Sarah Wolf <i>Advisors: Christine Mulvey, Brian Koo (Yale School of Medicine)</i>	60
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12:10 -12:25	Automated Imaging System for the Analysis of C.elegan Behavior Team 23: Alexa Lara, Joshua J. Mendoza, Celeste I. Vega <i>Advisor: Christopher V. Gabel (Dept. Pharmacology, Physiology and Biophysics, Chobanian & Avedisian School of Medicine, Boston University)</i>	61
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12:25 -1:15	Lunch Atrium	
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1:15 -1:30	Development and Integration of a Lensometer Attachment into a Commercial Handheld Autorefractor Team 30: Hanna Alarcon, Mario Rodriguez Santana <i>Advisors: Shivang Dave, Alec Wehse (PlenOptika, Inc.)</i>	62
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1:30 -1:45	Structural and Compositional Kinetics of α-Synuclein and its Pathological Mutants in Living Cells by Fluorescence Guided Mid-infrared Photothermal Spectroscopy Team 33: Ezekiel Cruz, Hanhminh Nguyen, Logan Packard <i>Advisors: Ji-Xin Cheng, Zhongyue Guo</i>	63
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1:45 -2:00	Laser Speckle Contrast Imaging for Superficial Tissue Blood Flow Visualization Team 36: Nadia Chitkushev, Ariel Lin <i>Advisors: Jerome Mertz, Shuqi Zheng</i>	64
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2:00 -2:15	fNIRS-Based Hyperscanning To Investigate Inter-brain Neural Synchronization in Communication-Based Language Therapy for Aphasia Team 3: Xingxiao Li, Yiwen Zhang <i>Advisor: David Boas</i>	65
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Session C

Devices **PHO 203**

Session Chair: Prof. Bela Suki	Page
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2:15 -2:30	Ergonomic Earphone Design for High-Fidelity Audio Delivery During Functional Magnetic Resonance Imaging (fMRI) and Electroencephalography (EEG) Team 26: May Aon, Massinissa Bosli, Rahul Rangarajan <i>Advisors: Laura Lewis, Stephanie Williams (Massachusetts Institute of Technology, Institute for Medical Engineering and Science, Department of Electrical Engineering and Computer Science)</i>	69
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2:30 - 2:45	Treating Alzheimer's with 40Hz Light Team 14: Miriam Bounar, Roop Chakrabarti, Jasper Ezekiel, Gary Gega, Abdulrahman Kobayter <i>Advisor: Andrey Vyshedskiy (Boston University, AlzLife)</i>	70
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2:45 -3:00	Canine Partial Limb Prosthetic Team 34: Benjamin Fang, Angelina Marrero, Owen O'Brien, Claudia Zaglewski <i>Advisors: Christopher Arena, Aleksandrs Zosuls</i>	71
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3:00-3:15 Coffee Break **Atrium**

3:15-3:30	A Fiber Stretching and Imaging System Team 11: Weikang Ai, Wang Yu <i>Advisors: Yuqing Deng, Bela Suki</i>	72
3:30-3:45	Stretcher-Ventilator System for Mechanotransduction Studies of Mice Tracheas Team 12: Ethan Curtis, Natalia Feced Garcia, Christopher Wu <i>Advisors: Joseph Hall, Bela Suki</i>	73
3:45-4:00	Exosome-Based Biomarker Discovery and Disease Diagnostics Team 31: Michelle Yung, Yilin Zhou <i>Advisors: Fei Liu, Wen Peng Liu, Yi Li (Brigham and Women's Hospital, Harvard Medical School)</i>	74

4:00-4:30 Awards and Closing Remarks **PHO 206**
Prof. Diane Joseph-McCarthy, Prof. Darren Roblyer, Prof. John White

Projects Previously Presented

Projects containing confidential information (private presentations)

Evaluating the Suitability of an In-vitro Human Endothelial Cell-based Assay to Assess CNS Penetration of Compounds

Team 19: Teertha Ayanji, Vatsal Shrivastava
Advisor: Praveen Bahadduri (C4 Therapeutics)