FEYISAYO EWEJE

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EDUCATION

Massachusetts Institute of Technology – *Ph.D. Student, Medical Engineering & Medical Physics (HST)* 2021 - present

- GPA: 4.5/5.0
- Activities: HST Joint Council (Public Service Chair, 2021-present)

Harvard Medical School – *M.D. Candidate, Health Sciences and Technology (HST) track* 2019 –present

- Activities: Student National Medical Association (Graduate Student Liaison, 2019-20), HST Joint Council (Public Service Chair, 2020-2021), HMS Health Professions Recruitment & Exposure Program (Mentor, DEI Committee Director, 2020-present). Student profile – Harvard Gazette.

Harvard College - *S.B., Engineering Sciences (Cum Laude)* 2015 –2019

- GPA: 3.8/4.0. Secondary in African American Studies.
- Activities: Harvard Society of Black Scientists & Engineers (President, 2017-18), Paraclete Afterschool Program teacher, Kuumba Singers of Harvard College (Musicians' Representative (2016-17). Student profile – Harvard SEAS.

RESEARCH EXPERIENCE

Self-assembling Peptide Nanoparticles for Delivery of Therapeutic Macromolecules 1/2020 – Present

Advisor: Elliot Chaikof | Wyss Institute for Biologically Inspired Engineering | Graduate Research Assistant

- Project: Self-assembling peptide nanoparticles for delivery of therapeutic macromolecules to targeted cell populations *in vivo*
- Work: Designing, expressing, and purifying recombinant amphiphilic peptides. Conducting physicochemical characterization of cargo-loaded nanoparticle formulations and evaluating *in vitro* delivery of genome editor and siRNA.

mRNA Delivery to Pulmonary Epithelium via Aerosolized Lipid Nanoparticles 7/2019 – 8/2019

Advisor: Daniel Anderson | Koch Institute for Integrative Cancer Research | Rotating Graduate Student

- Project: Aerosolized lipid nanoparticle formulation for delivery of therapeutic mRNA to pulmonary epithelium
- Work: Formed library of lipid nanoparticles and screened for mRNA encapsulation capability and aerosolization stability

Cardiovascular Tissue Models for Drug and Toxicant Screening 1/2016 – 9/2019

Advisor: Kevin Kit Parker | Wyss Institute for Biologically Inspired Engineering | Undergraduate Research Assistant

- Projects: 1) *In vitro* cardiac tissue models for screening drug candidates and studying disease mechanisms. 2) Endothelial cell pair model for evaluating the effects of engineered nanomaterials on vascular integrity.
- Work (Cardiac tissue models): Independently designed, constructed, and validated *in vitro* model of cardiac fibrosis. Fabricated instrumented cardiac tissue device and managed human/murine cell cultures for *in vitro* studies. Designed novel fabrication protocol for incorporating biomimetic nanofibers onto device substrate for cell culture.
- Work (Endothelial cell model): Built custom image analysis tools to quantify changes in endothelial cell morphology, actin organization, and junction protein expression. Managed cell cultures and conducted *in vitro* nanomaterial exposure studies.

Soft Material Biotelemetric Cardiac Sensor 6/2017 – 7/2017

Advisor: Kwanwoo Shin | Sogang-Harvard Center for Disease Biophysics Research

- Developed prototype for soft polymer-based biotelemetric catheter for heart chamber pressure and volume sensing

PUBLICATIONS *(* denotes equal contribution)*

[5] Ardoña HA, Shani K, Zimmerman JF, Kim S, **Eweje F**, Bitounis D, Parviz D, Casalino E, Strano M, Demokritou P, Parker KK. "Differential modulation of endothelial cytoplasmic protrusions after exposure to graphene-family nanomaterials." **Submitted.**

[4] Yadid M, Lind JU, Ardoña HA, Sheehy SP, Dickinson LE, Bastings M, Pope B, **Eweje F**, O'Connor BB, Straubhaar JR, Budnik B, Kleber AG, Parker KK. "Endothelial Extracellular Vesicles Contain Protective Proteins and Rescue Ischemia-Reperfusion-Injury in a Human Heart-on-Chip." ***Science Translational Medicine***, 14 October 2020, 12 (565). doi: 10.1126/scitranslmed.aax8005

[3] **Eweje F***, Ardoña HA*, Zimmerman JF, O'Connor BB, Ahn S, Grevesse T, Rivera KN, Demokritou P, Parker KK. "Quantifying the effects of engineered nanomaterials on endothelial cell architecture and vascular barrier integrity using a cell pair model." ***Nanoscale***, 24 September 2019, 11: 17878-17893. doi: 10.1039/C9NR04981A.

[2] Ahn S, Ardoña HA, Lind JU, **Eweje F,** Kim SL, Gonzalez GM, Liu Q, Zimmerman JF, Pyrgiotakis G, Zhang Z, Beltran-Huarac J, Carpinone P, Moudgil BM, Demokritou P, Parker KK. "Mussel-inspired 3D Fiber Scaffolds for Heart-on-a-Chip Toxicity Studies of Engineered Nanomaterials." ***Anal Bioanal Chem***, 10 May 2018, 410(24): 6141-6154. doi: 10.1007/s00216-018-1106-7

[1] Lind JU, Yadid M, Perkins I, O'Connor BB, **Eweje F**, Chantre CO, Hemphill MA, Yuan H, Campbell PH, Vlassak JJ, Parker KK. "Cardiac Microphysiological Devices with Flexible Thin-Film Sensors for Higher-Throughput Drug Screening." ***Lab on a Chip***, 28 September 2017, 17: 3692-3703. doi: 10.1039/C7LC00740J.

POSTERS & PRESENTATIONS

[1] **Eweje F**, Lind JU, Nesmith AP, Yadid M, Parker KK. "Utilizing hybrid polymer-protein nanofibers to promote skeletal muscle tissue development on an instrumented muscle-on-a-chip." Poster presented at: 2017 National Collegiate Research Conference; 2017 January 19-21; Cambridge, MA.

TEACHING EXPERIENCE

Health Science & Technology (HST) Program 1/2022 – Present

Teaching Assistant | HST.150 Principles of Pharmacology

- Organizing day-to-day classroom activities, including test writing and grading, lecture and activity coordination

Harvard School of Engineering and Applied Sciences 8/2018 – 12/2018

Teaching Assistant | ES 53: Quantitative Physiology as a Basis for Bioengineering

- Hosted office hours to assist students with homework assignments, helped to run laboratory sessions, graded homework and exams

WORK EXPERIENCE

Critical Healthcare Information Integration Network (CHIIN) 5/2020 – Present

- Non-profit offering an automated, free-for-use, SMS-enabled medical reference tool to rural African community health workers to aid in care provision
- Planned and executed multiple implementation programs in northern Nigerian in collaboration with local NGO, reaching 283 health workers and answering 4,597 information queries
- Leading internal product feature ideation and design efforts. Raised over $40,000 in grant funding to support project development
- Awards: Wharton Social Impact Prize, MIT IDEAS Social Innovation Award, Harvard iLab Social Impact Fellowship Award, Massachusetts Medical Society Information Technology Medical Student Award

Sarepta Therapeutics 10/2020 – 2/2021

Business Development Consultant | Supervisor: Fred Schnell, PhD

- Analyzed gene therapy and therapeutic genome editing developments in academia and industry to

synthesize reports on scientific advances, acquisitions, partnerships, licensing deals, and manufacturing

Harvard School of Engineering and Applied Sciences 6/2017 – 5/2019

Student Ambassador | Supervisor: Christina Zaldaña

- Led biweekly tours and information sessions for prospective students and their families
- Served as a bioengineering student adviser at department advising events

SKILLS

- **Molecular biology & Protein synthesis:** Gel electrophoresis, western blot, plasmid design and cloning, recombinant protein expression
- **Animal care** (mice): Handle and restraint, intraperitoneal and subcutaneous injections, dissection
- **Imaging:** Confocal microscopy, scanning electron microscopy
- **Material characterization:** Instron tensile testing, dynamic light scattering
- **Fabrication**: E-beam evaporation, Epilog laser cutting, rotary jet nanofiber spinning, photolithography, microcontact printing, nanofiber pull spinning, cleanroom
- **General wet lab**: Mammalian cell culture, immunohistochemistry, flow cytometry
- **Software**: Skilled in MATLAB, ImageJ, Python, SnapGene; experience with PyMol, PRISM, CorelDraw, C, Javascript, HTML, Swift, LabVIEW, Twilio

AWARDS & HONORS

- Alfred P. Sloan Foundation Graduate Fellowship (awarded October 2021) – *Awarded by Sloan-MIT University Center for Exemplary Mentoring to support graduate students from underrepresented backgrounds*
- NIH/NIGMS T32 institutional pre-doctoral MSTP training fellowship (awarded July 2019) – *Awarded to MD/PhD candidates at recipient institutions for support of medical and graduate training*
- 2019 Dean's Award for Outstanding Engineering Project – *Awarded annually to 4 senior design projects for excellence in engineering design, quantitative analysis, and reporting of results*
- 2017-18 John Harvard Scholar - *Awarded to students in the top 5% of their respective classes based on grade point average for a given academic year.*
- 2018 Amgen Scholar (Harvard site) - *Selected as one of 20 students nationwide for a summer research program in biotechnology at Harvard University*