Nicholas Scaperdas

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Objective

Bioengineer seeking to leverage skills in cell therapy, engineering design, experimental validation, and data analysis to develop life-changing discoveries and treatments in a research environment.

Experience

Temporary Research Assistant Feb. 2025 – Present

Mass Spectrometry Facility at Rutgers University *Piscataway, NJ*

- Utilized Q-Exactive HF and Eclipse mass spectrometers for experiments across Rutgers' research community
- Executed experiments including comparing drug retention between dried blood spot and plasma samples from rodents, identifying phosphorylated amino acids in cells injected with a developed compound, etc.
- Prepared and ran up to 100 samples per day for bottom-up analysis using techniques such as in-gel and on-bead digestion methods and liquid chromatography
- Presented, analyzed, and organized mass spectrometry data using software such as Xcalibur, UniDec, DIA-NN

Bio-inspired Materials Researcher Jan. 2023 – June 2023

The George J. Kostas Research Institute for Homeland Security *Burlington, MA*

- Formulated biocompatible hydrogels designed to swell and contract due to pH changes driven by E-coli metabolism
- Designed, coded, and integrated a device which uses gravity-based flow to automate buffer exchange and modify pH levels at specific time intervals using an Arduino microcontroller
- Quantified hydrogel size and color change over multiple weeks using customized scripts in ImageJ software
- Experiment to characterize the size and color change of a developed gel included as part of publication in *Matter*

Upstream Process Development Co-op Jan. 2022 – June 2022

Solid Biosciences *Boston, MA*

- Maintained multiple mammalian cell lines while conducting experiments to optimize virus production
- Prepared and managed bioreactor environments for production of HSV and AAV for development of a viral-vector-based gene therapy process targeted to treat Duchenne Muscular Dystrophy
- Managed bioreactor conditions using bioprocess automation software to control cell metabolism and growth
- Analyzed month-long experiments using Excel with data from electronic lab notebook or DeltaV bioreactor software

Projects

Indoor Air Quality Monitor Capstone | *SOLIDWORKS, KiCad, Arduino, C++, Git* July 2023 – Dec. 2023

- Constructed indoor air quality monitor over a six-month period for research purposes in Knox County, Maine to measure a wider range of air pollutants than commercially available devices
- Determined set of 10 pollutant sensors after an evaluation process, developing a schematic containing the integration and wiring necessary to use all sensors for continuous monitoring over a year long period
- Produced airflow simulations using SOLIDWORKS to design an optimal device casing

Tatum Robotics Bracelet/Doorbell | *EasyEDA, C++, Git* Jan. 2023 - May 2023

- Contributed to electrical design of bracelet and doorbell communicating via Bluetooth for use by the Deaf-Blind Community as part of a interdisciplinary engineering design team featured in *Northeastern News*
- Developed custom circuit board for both components, including part specification, schematic design, PCB routing, and assembly through soldering by hand or via soldering paste

Technical Skills

Skills: Mammalian Cell Culture, Mass Spectrometry, Aseptic Handling, 3D Printing, PCB Design/Assembly, CAD

Applications: Xcalibur, ImageJ DeltaV Bioreactor, SOLIDWORKS, KiCad, Abaqus FEA, Microsoft Excel

Programming Languages: C/C++, MATLAB, Java, Python, HTML, CSS

Education

Northeastern University Boston, MA

Bachelor of Science in Bioengineering, Minor in Computer Science *Sep. 2020 – May 2024*

Concentration in Biomedical Devices and Bioimaging *GPA: 3.9*