Jack F. Murphy

jack@mrph.dev | https://jack.engineering

Education

Trinity College Dublin | *B.A.I in Biomedical Engineering* Expected 2018 - 2022

Publications

Peer Reviewed | Full list at *https://jack.engineering/publications*

> Murphy, Jack F et al. "Adult human cardiac stem cell supplementation effectively increases contractile function and maturation in human engineered cardiac tissues." Stem cell research & therapy vol. 10,1 373. 4 Dec. 2019, doi: 10.1186/s13287-019-1486-4

Research Experience

Costa Lab, Icahn School of Medicine at Mount Sinai March 2017 - Present
Research Assistant New York City, USA

- Maintained human induced-Pluripotent stem cells, mesenchymal stem cells, and cardiac stem cells in culture.
- Differentiated pluripotent stem cells into cardiomyocytes and fabricated 3D human engineered cardiac tissues.
- Used LabView and MatLab to collect and analyze data on cardiac function.
- Designed and printed 3D accessories using Autodesk Fusion 360 to help with the data collection process.

Monaghan Lab, Trinity Centre for Bioengineering September 2018 - Present
Research Assistant Dublin, Ireland

- Stained and analyzed tissues using polarized light microscopy to understand the effects of a silicone implant.
- Developed a testing apparatus to determine if a scaffold propagates an electric pulse between tissue samples.
- Established a collaboration with the Costa Lab, and introduced a engineered cardiac tissue system into the lab.

Center for Excellence in Youth Education at Mount Sinai September 2016 – June 2018
Research Scholar New York City, USA

- Helped guide middle school students through dissections of the heart, eye, and kidney.
- Participated in the New York City Science and Engineering Fair with research carried out in the Costa Lab.

Projects

Cardiac Tissue Tracking System | *https://rianu.mrph.dev* June 2020 – Present

> ***Project Goal:*** Develop a system that can track and analyze multiple engineered cardiac tissues simultaneously.

- Created a web application to accept user input of post locations and used OpenCV libraries to track contractions.
- Utilized Plotly.js libraries to build a graphing dashboard that allows for complex contractile function analysis.
- Leveraged Docker containers to allow for simple, operating system agnostic deployment.

Volunteer Experience

Life Rolls on Foundation August 2018 - August 2019
Mid-Level Water Volunteer New York City, USA

- Annually, help give people with disabilities the opportunity to surf by helping position them on the board, carry them out past the wave breaks, and then guide their path on the way back in.

Voluntary Tuition Program September 2018 - May 2019
Maths Tutor Dublin, Ireland

- Met with a primary school student each week to aid them in their understanding of maths.

Skills

> **Programming:** C++, Python including Flask, Docker, and OpenCV **Data Analysis:** ImageJ, Graphpad Prism, R
> **Microscopy:** Tissue Staining, Confocal, Polarized Light **CAD:** OpenSCAD, SW, Autodesk[Inventor, Revit, Fusion]