Jack F. Murphy

Biomedical Engineering Student

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Education

Trinity College Dublin, The University of Dublin — *Dublin, Ireland*
B.A.I + M.A.I in Biomedical Engineering — *Expected Graduatation: 2023*

The High School for Mathematics, Science, and Engineering (HSMSE) — *New York City, United States*
New York Regents Diploma with Honors — *Graduated: 2018*

Publications

Turnbull, I. C., Mayourian, J., Murphy, J. F., Stillitano, F., Ceholski, D. K., & Costa, K. D. (2018). Cardiac Tissue Engineering Models of Inherited and Acquired Cardiomyopathies. Methods Mol Biol 1816: 145-159

Mayourian, J., Ceholski, D. K., Gorski, P. A., Mathiyalagan, P., Murphy, J. F., Hare, J. M., Sahoo, S., Hajjar, R. J., & Costa, K. D. (2018). MicroRNA-21-5p as an Exosomal Mediator of Mesenchymal Stem Cell Paracrine Effects on Human Engineered Cardiac Tissues Contractility. Circ Res 122(7): 933-944

Research Experience

Lab Assistant — *Monaghan Lab, Trinity Biomedical Sciences Institute*
September 2018 - Present — *Dublin, Ireland*

- Stain tissues for histological analysis.
- Analyze tissues using polarized light microscopy and ImageJ to understand the effects of a silicone implant.

CEYE Research Scholar — *Costa Lab, Icahn School of Medicine at Mt. Sinai*
September 2016 - June 2018 — *New York City, United States*

- Helped to guide middle school students through dissections of the heart, brain, eye and kidney.
- Differentiated induced-Pluripotent stem cells into cardiomyocytes and fabricated 3-D human engineered cardiac tissues.
- Used LabView and MatLab to collect and analyze data on cardiac function.
- Designed and printed 3-D accessories using Autodesk Fusion 360 to help with the data collection process.

Lab Assitant — *Dean Lab, Columbia University*
June 2017 - December 2017 — *New York City, United States*

- Created a device with graphene insulated by a layer of boron nitride on each side.

Volunteer Experience

Maths Tutor — *Voluntary Tuition Program (VTP), Trinity College Dublin*
September 2018 - Present — *Dublin, Ireland*

- During term, meet with a student for one hour each week to aid them in their understanding of maths.

Volunteer — *Key Club, HSMSE*
September 2015 - June 2018 — *New York City, United States*

- Volunteered at events such as community walks, soup kitchens, restoration efforts, and fundraisers.

Big Sib and Tutor — *Mentoring Program, HSMSE*
June 2015 - June 2018 — *New York City, United States*

- Mentored incoming freshman and assisted them in their transition to high school by meeting with them periodically.
- Worked with students both in small groups and indiviually to help them in English and Algebra.

Key Skills

Culture of:

- human induced-Pluripotent Stem Cells (hiPSC)
- human Mesenchymal Stem Cells (hMSC)
- human Cardiac Progenitor Cells (hCPC)

Fabrication of:

- human Engineered Cardiac Tissues (hECT)

Proficient in:

- LabView for data collection
- MatLab for data analysis
- ImageJ/FIGI for image analysis
- Autodesk Inventor, Revit, and Fusion 360
- Tissue staining for histology
- Polarized light microscopy