Joseph P. Licata

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EDUCATION

Temple University, College of Engineering — Philadelphia, PA
*PhD in **Bioengineering*** — Expected Graduation: August 2024

University of Pennsylvania, School of Engineering and Applied Science — Philadelphia, PA
*Master of Science in Engineering, **Bioengineering** Class of 2017*
Major: **Bioengineering**
Bachelor of Science in Engineering Class of 2016, Cum Laude
Major: **Bioengineering** Minor: **Mathematics**

RESEARCH EXPERIENCE

Temple University Department of Bioengineering *2018-Present*
Graduate Researcher under Peter Lelkes, PhD. Developed novel bioreactors to explore the effect of electrical stimulation on stem cell-derived cardiomyocyte differentiation *in vitro.*

- Designed and fabricated a custom bioreactor capable of electrical stimulation and low shear fluid flow for enhanced differentiation of stem cell-derived cardiomyocytes. Worked with 3D-printing, microcontrollers, and computational modeling.
- Analyzed cardiomyocyte differentiation using flow cytometry, qPCR, and immunostaining.
- Optimized protein/polymer solutions for electrospinning nanofibrous scaffolds.
- Fabricated numerous low-cost accessories for laboratory use.
- Managed laboratory equipment, inventory, and training/managing of undergraduate students.
- Worked with neurosurgery team to invent and test a device for aiding in the placement of external ventricular drains and draft patent-related documentation (patent pending).

Center for Neurodegenerative Disease Research – Penn Medicine *2016-2018*
Full-time Research Specialist working under Rizwan Akhtar MD, PhD. Developed ELISA based assays for the detection of protein biomarkers for Parkinson's Disease in patient biofluids.

- Performed high-throughput screening of patient biofluid samples using novel immunoassays.
- Synthesized and purified recombinant protein using FPLC for use in assay development.
- Presented research and participated in a weekly journal club.

University of Pennsylvania School of Engineering and Applied Sciences *2015-2016*
Research Assistant under Paul Ducheyne, PhD., Dept. of Bioengineering. Fabricated and tested biomaterials for bone repair and wound healing.

- Developed new method of fabricating scaffolds for bone repair using 3D printing technology.
- Optimized sol-gel biomaterials for use in time-release delivery of local anesthetic.

Children's Hospital of Philadelphia Department of Genetics *2014-2016*
Research Assistant under Marni Falk, MD. Studied mitochondrial disease and researched treatments for rescuing mitochondrial disfunction.

- Cultured human cells and C. Elegans expressing mitochondrial mutations.
- Analyzed gene expression of samples using Western Blot and qPCR.

University of Pennsylvania Bioengineering Senior Design Project *2015-2016*
Senior Design group under Andrew Maidment, PhD. Worked to design a digital breast tomosynthesis machine implementing the concept of super-resolution for better early cancer detection.

- Won top 3 projects in Bioengineering and 5th overall for the entire engineering school.

TEACHING EXPERIENCE

Adjunct Instructor *2020-2023*

Temple University Department of Bioengineering. Taught a bioengineering general education class called "The Bionic Human" which aims to teach students an overview of technologies for improvement of the human body. Redesigned course for online, summer instruction.

Graduate Student Teaching Assistant *2019-2024*

Temple University Department of Bioengineering. Worked as a teaching assistant for multiple laboratory courses. Developed and tested protocols, prepared materials for students, assisted in teaching techniques to students, and graded assignments.

SKILLS and TECHNIQUES

- Mammalian cell culture, including induced pluripotent stem cell culture
- Multi-color flow cytometry
- Isolation of DNA/RNA and analysis by PCR, RT-qPCR
- Protein isolation and analysis by western blot, ELISA
- Histology and Immunohistochemistry
- Light microscopy, Fluorescence microscopy, SEM
- Protocol optimization
- Electrospinning of organic polymers into nanofiber scaffolds
- Electronic circuit design and prototyping
- CAD, 3D printing, and machining of parts and devices
- MATLAB, Java, R, and Arduino programming
- Technical writing and communication, including patent-related writing

AWARDS

- Temple University 3-Minute-Thesis Competition Finals – 1st Place
- Temple College of Engineering 3-Minute-Thesis Competition – 1st Place
- Temple University Presidential Fellowship
- 2016 University of Pennsylvania Bioengineering Senior Design Award

PUBLICATIONS and PRESENTATIONS

Licata et al. Biocompatibility of 3D Printed Plastics for use in Bioreactors. *Bioprinting, 40,* e00347. https://doi.org/10.1016/J.BPRINT.2024.E00347

Licata and Pathak et al. Development of an adjustable patient-specific rigid guide to improve the accuracy of external ventricular catheter placement. *J Neurosurg.* 2024 May 10. doi:10.3171/2024.2.JNS232137

Licata et al. Bioreactor Technologies for Enhanced Organoid Culture. *Int J Mol Sci*. 2023 Jul 13;24(14):11427. doi:10.3390/ijms241411427.

Akhtar, RS et al. Measurements of auto-antibodies to α-synuclein in the serum and cerebral spinal fluids of patients with Parkinson's disease. *J Neurochem*. 2018 Mar 3. doi: 10.1111/jnc.14330

Peng et al. Inhibiting cytosolic translation and autophagy improves health in mitochondrial disease. *Hum. Mol. Genetics.* (2015) 24 (17): 4829-4847 doi: 10.1093/hmg/ddv207

Licata et al. Novel Bioreactor for Enhanced Fluid Flow and Electrical Stimulation of Engineered Excitable Tissues. *BMES Annual Meeting 2022, San Antonio, TX*. October 15, 2022

Licata, JP et al. Improved PEDOT:PSS as a transparent conducting surface for use in electrically stimulating bioreactors. *Temple University Graduate Research Competition 2020*.

Licata et al. Development of an Adjustable Patient-Specific Rigid Guide to Improve Accuracy of External Ventricular Drain (EVD) Placement. *Temple University Graduate Research Competition 2023*