

Joseph P. Licata, PhD

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EDUCATION

Temple University, College of Engineering	Philadelphia, PA
PhD in Bioengineering	2024
University of Pennsylvania, School of Engineering and Applied Science	Philadelphia, PA
MS in Engineering, Bioengineering	2017
BS in Engineering, Bioengineering	2016

RESEARCH EXPERIENCE

Temple University, Department of Bioengineering August 2024-Present

Postdoctoral Fellow. Determined the effects of electrical stimulation on cardiomyocyte maturation

- Continued and expanded upon doctoral dissertation research.
- Performed preliminary research for the submission of grants exploring cardiac differentiation.
- Mentored undergraduate research and grant/publication writing

Temple University, Department of Bioengineering 2018-July 2024

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

- Optimized cell culture processes and media formulations for iPSC-derived cardiac differentiation
- Designed, fabricated bioreactors capable of electrical stimulation and low shear fluid flow for differentiation of stem cell-derived cardiomyocytes.
- Utilized flow cytometry, qPCR, and immunostaining to demonstrate subtype-specific differentiation of cardiomyocytes due to the effect of electrical stimulation.
- Designed and characterized protein-polymer solutions for nanofiber electrospinning.
- 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).

Penn Medicine, Center for Neurodegenerative Disease Research 2016-2018

Research Specialist under Rizwan Akhtar MD, PhD. Developed ELISA based assays for the detection of protein biomarkers for Parkinson's Disease in patient biofluids.

- Designed ELISA assays to quantify α -synuclein auto-antibodies in patient biofluid samples to determine a correlation between antibody titer and disease state.
- Utilized ELISA to measure misfolded and mutated α -synuclein in patient biofluids.
- Synthesized and purified recombinant protein using FPLC for use in assay development.

University of Pennsylvania, School of Engineering and Applied Sciences 2015-2016

Research Assistant under Paul Ducheyne, PhD., Tested biomaterials for bone repair and wound healing.

- Developed method of fabricating scaffolds for bone repair via sacrificial 3D printed materials.
- 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. Researched treatments for rescuing mitochondrial dysfunction in primary cells and model organisms.

- Cultured human cells and *C. Elegans* to study detrimental mitochondrial mutations.
- Developed novel protocol for mitochondrial protein extraction and western blot analysis

TEACHING EXPERIENCE

Temple University Department of Bioengineering

2020-2023

Adjunct Instructor. 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.

Temple University Department of Bioengineering

2019-2024

Graduate Student Teaching Assistant. 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 (BSL2), including primary, cancer, ESC, and hiPSC experience
- Cell culture process development
- Bioreactor development, optimization
- Multi-color flow cytometry
- Western blot, ELISA development
- Nucleic acid isolation, PCR, RT-qPCR
- Degradation analysis of protein nanofibers
- Histology, Immunocytochemistry
- Fluorescence microscopy, SEM
- Protocol optimization, immunoassay development
- Computational fluid dynamics
- Electronic circuit design and prototyping
- CAD, 3D printing, and machining
- MATLAB, Java, Python, and Arduino
- Statistical Analysis using R, JMP, Excel
- Verbal and written scientific communication

AWARDS

- Temple University 3-Minute-Thesis Competition Finals – 1st Place, People’s Choice Award
- 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. Novel, Low-Cost Bioreactor for In Vitro Electrical Stimulation of Stem Cell-Derived Cardiac Cells. *Front. Bioeng. Biotechnol.* 2025. doi: 10.3389/fbioe.2025.1531731

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. 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. *In Vitro* Electrical Stimulation of Stem Cell-Derived Cardiomyocytes. *Temple University Graduate Research Competition 2023.*

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 et al. Preliminary epitope mapping of α -synuclein auto-antibodies. *Center for Neurodegenerative Disease Research 2016 Poster Competition* (2016). Philadelphia, PA