

Gerard Lorio

B.S. in Biological Engineering
Louisiana State University,
Baton Rouge, LA 70808
Aug 2022 – May 2026
GPA Cumulative: 4.06; Science: 3.97

Email: glorio3@lsu.edu
Phone Number: (225) 964-1568

Research Experiences

Segura Functional Biomaterials Laboratory | Duke Biomedical Engineering

May 2025 – Present

Bioorthogonal Click Chemistry for Kidney Transplant Survival

- Engineered a custom 96-well plate to improve reproducibility of scratch assays for testing immunosuppressant therapies.
- Monitored kidney function through blood serum analysis and immunofluorescent staining, contributing to evaluation of transplant outcomes.
- Quantified panoramic kidney sections (20x) using QuPath, comparing tissue modifications across experimental groups.

CODEX Multiplexed Imaging Analysis

- Programmed a data pipeline integrating clustering and spatial statistics to identify immune cell types and co-localization patterns in kidney tissue.
- Enhanced image assessment accuracy by developing standardized analysis workflows for high-plex immunofluorescence datasets.

Tracking Skin Graft Acceptance Using GFP/Luciferase Mice

- Quantified wound healing kinetics in vivo using Fiji (ImageJ), producing graphical overlays to visualize closure trend across groups.

Monroe Microfluidics Laboratory | LSU Biological Engineering

Aug 2022 – Present

Nanotechnology-Enhanced Microfluidic Devices

- Invented a cost-effective TiO₂-based surface coating that improved dimensional accuracy in measuring transparent microfluidic devices.

3D ECM Model of Adipose Tissue for TNBC Therapy

- Increased reproducibility of fish gelatin methacrylate synthesis by integrating a flow pump, strengthening consistency for tumor microenvironment models.

Quantum Science and Technologies Group | LSU Physics.

Mar – July 2020

Dowling & Wilde Quantum Physics Laboratory. *Proof of the Decoherence Effect of Quantum Mechanics*

- Demonstrated decoherence of a single-qubit system via quantum mechanical modeling and linear algebra, validating theoretical predictions of environmental interactions

Awards & Honors

- Duke Amgen Scholar Program** | Mar 2025 – Selected for competitive national research fellowship at Duke University.
- Goldwater Scholar** | Mar 2025 – National STEM award recognizing top undergraduate researchers.
- LSU Distinguished Undergraduate Researcher Candidate** | Jan 2025 – University honor for exceptional faculty-mentored research.
- LSU Distinguished Communicator Candidate** | Jan 2025 – Honors students who demonstrate excellence in written, spoken, visual, and technological communication.
- Albert P. Halluin Memorial Alumni Scholarship** | Nov 2024 – Merit-based scholarship for outstanding nanotechnology research.

Publications & Presentations

- Duke Summer Symposium** | Jul 2025 – Poster and oral presentation non improving kidney transplantation outcomes using a co-stimulation molecule.
- LSU Discover Day** | Apr 2025 – Poster and oral presentation on TiO₂ nanoparticle surface coatings for microfluidic imaging; ranked top 5 presenter in the College of Engineering.
- Semmes, I.*, Lorio, G. K.*, Kewir, F. V., Belgodere, J. A., & Monroe, W. T. (2025). Evaluation of Titanium Dioxide Nanoparticle Suspensions as a Low-Cost Surface Coating to Improve Optical Profilometry of Transparent 3D-Printed Microdevices. *ACS applied optical materials*, 3(4), 871–880. <https://doi.org/10.1021/acsao.5c00010>
- Physics and Astronomy Summer Undergraduate Research Forum** | Jul 2020 – Oral presentation on quantum decoherence.

Leadership Experiences

- Organic Chemistry II Supplemental Instructor (SI) Leader** | Jan 2025 – Present – Designed worksheets and facilitated post-class review sessions to reinforce lecture material; led exam review sessions for up to 150 students, independently managing all aspects of instruction.