Josselyn Lorena Mata Calidonio

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PROFESSIONAL SUMMARY

Ph.D. candidate with 4+ years of experience in **nanotechnology, assay development, and diagnostics,** with a track record of bridging biology, engineering, and computation to drive innovative healthcare solutions.

AREAS OF EXPERTISE

- Assay Development & Validation
- Nanotechnology & Bioconjugation
- Rapid Diagnostics & Optimization
- Molecular Cloning & Cell Culture
- Protein Expression & Purification
- Cross-Functional Collaboration
- Biophysical Characterization
- Translational Research
- AI & Computational Analysis

KEY ACHIEVEMENTS

- **Multiplexed Diagnostic Development**: Designed and validated lateral flow assays for **simultaneous detection of 15+ viruses in one test**, & created 6 low-cost, field-ready platforms for infectious disease detection in low-resource settings.
- **Therapeutic Nanotechnology:** Engineered a nanoparticle vaccine against fungal infection in salamanders and gained cross-functional insight into nanoparticle-based drug delivery systems.
- **Space Pharmacy with SpaceX and NASA**: Contributed to the development of 19 microfluidic diagnostic and chemical synthesis experiments launched aboard the International Space Station (**SpaceX CRS-27, March 14th, 2023**), supporting sustainable biomanufacturing approaches for global health applications.

EDUCATION

UNIVERSITY OF MASSACHUSETTS BOSTON — Boston, MA | June 2021- May 2026

- **Doctor of Philosophy in Integrative Bioscience; Biophysics Track** — **GPA: 3.97**

EASTERN NAZARENE COLLEGE — Quincy, MA | August 2017- May 2021

- **Bachelor of Science, Double Major in Electrical Engineering and Mathematics** — **GPA: 3.99**

PROFESSIONAL EXPERIENCE

GRADUATE RESEARCH ASSISTANT, UMASS BOSTON — Boston, MA| June 2021 – Present

- Conducted 15+ independent research projects in nanotechnology-based diagnostics and sensors, focusing on assay development, biosensor engineering, and data-driven optimization for pathogen detection.
- Implemented image processing and machine learning pipelines to develop diagnostics more effectively and analyze assay outputs, resulting in tests with 90%+ accuracy and faster development timelines.
- Collaborated with interdisciplinary teams to design, execute, and present experimental studies, contributing to 10 peer-reviewed publications and 4 conference presentations.

ASSAY DEVELOPMENT INTERN, NANOPATH DX — Cambridge, MA| May 2023 – August 2023

- Developed rapid diagnostic platforms using nanoparticles and nucleic acid hybridization for sensitive viral, bacterial, and fungal pathogen detection.
- Optimized assays and formulations, performing quantitative data analysis to enhance accuracy and reproducibility.
- Validated assay sensitivity and specificity to improve diagnostic reliability for regulatory and clinical use.

PUBLICATIONS & ADDITIONAL SKILLS

- **Publications:** 10 first-author peer-reviewed papers; Orcid #: 0000-0002-4818-2638
- **Dry Lab Skills**: Image analysis, signal processing, machine learning and linear algebra analysis algorithms, biostatistics, 3D modeling/printing, laser cutting, circuitry, data analysis.
- **Wet Lab Skills**: antibody bioconjugation, PCR, gel electrophoresis, DLS, UV-VIS spectroscopy, Raman/SERS, Microscale Thermophoresis. BSL2 and BSL2+ training.
- **Software**: LabView, Fusion 360, OriginLab, ImageJ, Inkscape, SPICE, Canva, Microsoft Office.
- **Programming**: Python, C, C++, R, MATLAB, HCS12 Assembly.
- **Mentorship**: Guided 11 students from different academic backgrounds with independent research projects.
- **Languages**: Fluent English and Spanish; basic Mandarin Chinese.