**Lucas J. Carbajal**

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**EDUCATION**

**University of Miami**, Coral Gables, FL

Baccalaureate of Science 2020-Present

*Major: Biology*

*Major GPA: 4.0*

*Minors: Mathematics, Biophysics*

*Mathematics Minor GPA: 3.9*

*Biophysics Minor GPA: 4.0*

**Awards/Honors**: Dean’s List, Provost’s Honor Roll, President’s List, Canes Achievement Award, CV Starr Scholarship, Priscilla J. Schneller Memorial Scholarship, Mildred Lunas Bain Memorial Scholarship, Mycological Society of America SPORES Program Recipient

**RELEVANT COURSES**

* Biophysics, Organic Chemistry, Cellular & Molecular Biology, Genetics, Molecular Genetics Lab, Ecology & Lab, Comparative Physiology, Probability & Statistics, Ordinary Differential Equations, Linear Algebra, Microbiology & Immunology Lab

**RESEARCH PRESENTATIONS**

*Howard Hughes Medical Institute Research Open Symposium* (BIL153/CHM113) Fall 2020

“Neurological and Physiological Effects of Reactive Oxygen Species on Drosophila Flies”

* Conducted a literature review on the impact of reactive oxygen species and fluorescence, then designed & executed experiments testing the effects of ROS species in biological systems.
* Developed functional suspension concentration of fluorescent dyes.
* Acquired and reared *Drosophila* cultures for seven weeks while treating each set with differing fluorescent additives along with a control group.
* Performed spectral analysis on fluorescent dyes and conducted physiological aptitude screens on *Drosophila* flies.
* Conducted statistical analysis of findings and discussed correlations and conclusions.

Howard Hughes Medical Institute Research Open Symposium (BIL163/CHM201) Spring 2021

“The Effects of Green and Black Tea Yeast Pastes On *Drosophila* Survival Upon Exposure to UV Radiation.”

* Conducted a literature review on antioxidants' impact on longevity and cancerous growths then discussed hypotheses and experimental design.
* Performed extraction of organic compounds and developed protocol with a team to increase yield concentration.
* Compared the inhibitor effects of organic compounds on the Tyrosinase associated with the melanin production pathway.
* Established and maintained a *Drosophila* culture while conducting a longitudinal study on post-treatment survival rates.
* Analyzed survival rate data and discussed probable explanations for the variable survival outcomes.

**LABORATORY/RESEARCH EXPERIENCE**

**University of Miami,** Afkhami Ecology-Evolution-Genomics Lab

*Laboratory Assistant* Spring 2022-Present

* Inoculated *Medicago truncatula* samples with microbes to establish pathogen-symbiote-host systems.
* Cultured bacteria and fungi through aseptic technique and quantified microbes through microscopy and spectrophotometry.
* Collected weekly measurements on the growth and health of approximately 150 *M. truncatula* samples and recorded morphology after periodically harvesting samples.
* Conducted RNA extractions on samples and measured the quantity of DNA through a Qubit Fluorometer.
* Modified procedure and created a tool to prevent contamination during soil DNA extraction process.

**University of Miami,** Winter Beckles’ Evolutionary Ecology Research

*Research Assistant* Fall 2022-Present

* Collected environmental data regarding anoles along a selected path through urban areas in Miami.
* Used RStudio to construct spectral graphs from collected data.
* Proposed behavioral catalogs to research invasive species’ interactions in a non-native environment.
* Worked under IACUC guidelines and analyzed the process for which further research could be conducted.

**WORK EXPERIENCE**

**University of Miami, Biology Department** Miami, FL

*Laboratory Assistant to Introductory Biology Labs* August 2021-Present

* Maintained inventory of materials for introductory undergraduate teaching labs
* Prepared experiments before instruction of undergraduate labs via procuring & maintaining live specimens, mixing chemicals, and acquiring lab materials.
* Collaborated with supervising professor in creating more accessible working environments for new hires.
* Troubleshoot unforeseen issues that arose due to material or equipment errors before and during instructional periods of undergraduate teaching labs.

**SKILLS**

* Proficient in MATLAB to create models for scenarios and analyze the impact of varying levels of independent variables.
* Proficient in R to manipulate, filter, analyze data, and construct various graphs.
* Proficient in Microsoft Excel for Statistical Analysis and construction of various graphs.
* Proficient in compound microscopy for the quantification of spores and the differentiation of bacteria by morphology & staining.
* Proficient in dissecting microscopy to gender and performing surgical extraction of *Drosophila* organs.
* Proficient in dissecting microscopy to perform amputations on planaria and analyze their development & regeneration patterns.
* Proficient in column chromatography to isolate compounds.
* Proficient in the distillation process to extract and isolate compounds.
* Proficient in gas chromatography to analyze the purity of isolated compounds.
* Proficient in aseptic techniques and culturing techniques to grow and transfer microbes, including fungi and bacteria.
* Proficient in transformation techniques to generate bacteria with various plasmids.
* Proficient in PCR techniques to amplify DNA to generate plasmids and quantify the presence of segments in DNA.
* Proficient in RNA and DNA extraction processes.
* Proficient in gel electrophoresis and reading of gels to analyze the contents of DNA.
* Proficient in generating behavioral catalogs and monitoring subjects to collect behavioral data.