

**Daniela E. Cárdenas**

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As a driven researcher with a Ph.D. in Plant Pathology, I am particularly focused on utilizing molecular biology, bioinformatics, and genomics to address critical challenges. I'm mainly interested in studying how plants and pathogens interact on a molecular level to create new ways to protect and improve crops. I am excited to work on projects that take scientific discoveries and turn them into practical solutions that help farmers grow healthier, more resilient crops.

***Education***

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**August 2018- December 2022:** PhD in Plant Pathology - University of Florida.

**September 2016-July 2017:** Master's in Biotechnology - Universidad Autónoma de Madrid, Spain.

**October 2006-June 2013:** Engineer in Biotechnology – Universidad de las Fuerzas Armadas-ESPE, Ecuador.

***Professional Experience and Technical Skills***

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**Research and Laboratory Experience**

- Conducted independent research on the molecular mechanisms of plant-pathogen interactions, focusing on plant defense responses (resistance) and pathogen virulence.
- Designed and executed experiments to explore molecular pathways during stress, stimulation, and infection in both plant and animal/human cell lines.
- Utilized advanced molecular biology techniques including DNA/RNA extraction, purification, cloning, transformation, PCR amplification, RT-PCR, sequencing, immunoblot, ELISA, immunofluorescence, flow cytometry, and confocal microscopy to investigate and analyze gene expression and modified proteins.
- Proficient in cell culture techniques with extensive experience working with both plant and animal cell lines, ensuring accurate and reproducible results.
- Published research findings in peer-reviewed journals and presented at national and international conferences, demonstrating strong written and verbal communication skills.
- Served as a Teaching Assistant for microbiology laboratory classes, providing hands-on instruction in molecular techniques, guiding students through experimental protocols, and supporting their understanding of complex concepts.
- Mentored undergraduate and graduate students in the lab, offering guidance on experimental design, troubleshooting, data interpretation, and assisting in the preparation of their research presentations and publications.
- Participated in outreach and extension events, delivering presentations and workshops on molecular biology and plant pathology to diverse audiences, including farmers, students, and the public.

## **Bioinformatics and Data Analysis**

- Analyzed complex biological data sets using bioinformatics tools such as comparative genomics, transcriptomics, and functional annotation of secreted proteins from plants and fungi to derive meaningful conclusions and contribute to the understanding of plant defense and susceptibility signaling pathways.
- Proficient in bioinformatics tools and data analysis software, including R, Python, Perl, and cluster computing, for the interpretation of large-scale transcriptomic data and gene expression analysis.
- Experienced in functional annotation of proteins and secretome analysis, contributing to the identification and characterization of plant-pathogen interactions.
- Assisted in the grant writing process, contributing to the development of bioinformatics-driven project proposals that successfully secured funding for research on plant-pathogen interactions.
- Mentored undergraduate and graduate students in bioinformatics techniques, guiding them through data analysis workflows, interpretation of genomic and transcriptomic data, and the application of bioinformatics tools in their research projects.

## **Additional Skills**

- Strong organizational and multitasking abilities, with a keen attention to detail and a commitment to meeting project deadlines.
- Excellent communication skills, demonstrated through the preparation of peer-reviewed publications and conference presentations.
- Ability to work independently as well as collaboratively in a team-oriented research environment, ensuring the successful completion of complex projects.

## ***Research Experience***

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**September 2023-present:** Post-Doctoral Associate at the University of Florida.

- Genomics and transcriptomics of plant pathogens such as sugarcane, avocado and citrus, plant pathogen interaction.

**August 2018-December 2022:** PhD student in the Department of Plant Pathology at the University of Florida.

- Transcriptomic analysis of the sugarcane orange rust pathogen *Puccinia kuehnii*.
- Differential expression of sugarcane infected with *Puccinia kuehnii*, the fungal pathogen causing orange rust.
- Genomic analyses of the interactions between sugarcane and *Puccinia kuehnii* causing orange rust.

**April 2018-July 2018:** Genetic resources specialist at Universidad Regional Amazónica IKIAM - National Environment Department of Ecuador.

- Discovery of active compounds derived from the secretion of the skin of Ecuadorian amphibians with potential applications in biomedicine.

**January 2017-June 2017:** Master research assistant in the Laboratory of Experimental Nephrology and Vascular Pathology - University Hospital Foundation Jiménez Díaz, Madrid-Spain.

- Mechanisms of death caused by the nephrotoxicity of omeprazole in cell cultures (human HK-2 and murine MCT).

**May 2015-September 2016:** Laboratory analyst at the Institute for Research in Public Health (INSPI), Quito-Ecuador.

- Processing of samples for diagnosis of infectious diseases (Rotavirus, Dengue, Chikungunya, Rubella and Measles).
- Analysis of CD4 flow cytometry and HIV viral load for epidemiological studies in human health.

**October 2014-February 2015:** Assistant researcher at the Laboratory of Plant Pathology at Oklahoma State University.

- *Agrobacterium* based transformation of *Bipolaris* spp. to express the fluorescent protein tdTom.
- Identification and biological characterization of *Bipolaris* spp. (*Cochliobolus* spp.) infecting species of *Cynodon* influenced by culture, nitrogen fertilization and host organ.

**November 2013-May 2014:** Undergraduate researcher and teacher assistant at the Microbiology Laboratory of the University of the Armed Forces-ESPE, Ecuador.

- Identification and isolation of microalgae from the San Pablo Lake province of Imbabura.

**October 2012-January 2013:** Research in Environmental Laboratory of the University of the Armed Forces-ESPE, Ecuador.

- Microanalysis of arsenic and invertebrates in water at Papallacta river.

**January 2013-February 2013:** Laboratory assistant at the Autonomous National Institute of Agricultural Research (INIAP), Ecuador.

- Tissue culture and micropropagation of tomato; analysis of DNA extraction, PCR and sequencing on corn.

### ***Professional Events and Honors***

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#### **Oral Presentations:**

- Oral presentation at the American Society of Sugarcane Technologists (ASSCT), June 21-23, 2022. (Won Best Oral Student Presentation)
- Oral presentation at the American Phytopathological Society (APS), August 2–6, 2021.
- Oral presentation at the Florida Phytopathological Society Meeting (FPS), May 13-15, 2021.

#### **Poster Presentations:**

- Poster presentation at the Chateaubriand Fellowship meeting, November 4th, 2022.
- Poster presentation at the American Phytopathological Society (APS), August 8–12, 2020.
- Poster presentation at the American Society of Sugarcane Technologists (ASSCT), June 17-19, 2020.
- Poster presentation at the American Society of Sugarcane Technologists (ASSCT), June 26-28, 2019.

#### **Awards:**

- Best Oral Student Presentation at the American Society of Sugarcane Technologists (ASSCT), June 21-23, 2022.
- Second Place for Poster Presentation at the Chateaubriand Fellowship meeting, November 4th, 2022.

#### **Fellowships:**

- Scholarship of Excellence in Postgraduate Program in Molecular Bioscience – Master’s in Biotechnology (Universidad Autónoma de Madrid – Spain) September 2016-July 2017.
- Scholarship for an internship in the Plant Pathology Department (Oklahoma State University), October 2014-February 2015.

#### **Leadership:**

- President of the Treasure Graduate Students Organization 2019-2021 (IRREC).
- Organizer of the Plant Pathology Meeting for Students and Postdoctoral Researchers on May 14<sup>th</sup> 2024.
- Local coordinator for the Florida Phytopathological Society (FPS) team.

#### **Extension/Outreach:**

- Participate and contribute with organization at the IRREC Open house event in 2023 and 2024.
- Participate in the Scientific Problem-solving Academy for Research and Knowledge (SPARK) STEM Fair at JD Parker Elementary School as scientist mentor in 2024.

#### **Societies:**

- Member of the American Phytopathological Society (APS).
- Member of the American Society of Sugarcane Technologists (ASSCT).
- Member of the Florida Phytopathological Society (FPS).

#### **Creative work:**

- <https://www.youtube.com/watch?v=yZU94rVb5-s>
- <https://www.youtube.com/watch?v=7QodqLr0pdc>

### ***Publications***

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- Daniela E. Cárdenas, Sushma Sood, Martha A. Hincapie, Jose Tapia, Jianping Wang, Philippe C. Rott, Liliana M. Cano. **A Diagnostic Guide for Orange Rust Disease of Sugarcane**. Plant Health Progress. Accepted first look. <https://doi.org/10.1094/PHP-02-24-0013-DG>. (*The manuscript was recently accepted and will be evaluated for this Publication Award*).
- Jiuxu Zhang, Jiaqi Yan, Jihne Bai, Cuifeng Hu, Tengfei Pan, Yisel J. Carrillo, Daniela E. Cardenas, Lilian M. Cano, and Mark A. Ritenour. **Lasiodiplodia pseudotheobromae causing Postharvest Decay of Strawberries in Florida**. Plant Health Progress. <https://doi.org/10.1094/PDIS-07-23-1376-PDN>.
- Fontecha-Barriuso, M., Martín-Sánchez, D., Martínez-Moreno, J. M., Cárdenas-Villacrés, D., Carrasco, S., Sánchez-Niño, M. D., et al. (2020). **Molecular pathways driving omeprazole nephrotoxicity**. Redox Biology 32, 101464. doi:<https://doi.org/10.1016/j.redox.2020.101464>.

### ***Language skills***

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Spanish – Native. English – Fluent, both oral and written.

### ***References***

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