Curriculum Vitae

🎓 Education

Doctor of Philosophy

2018 – 2024 Tulane University, Department of Ecology and Biology

Master of Science

University of Michigan – Ann Arbor - Major: Conservation Ecology

Bachelor of Arts

University of Puerto Rico – Rio Piedras

- Major: Political Science (Magna Cum Laude)

🧠 Skills

Leadership	Effective communication, Decision-Making, Critical thinking, Team collaboration, Problem-solving, Adaptability
Interpersonal Skills	Mentoring, Cross-functional collaboration, Team-building, Conflict resolution, Stakeholder communication
Programming/Interface	R, Python, Bash, Rust, SQL, LaTex, Markdown
Data/Web Reporting	Quarto, Shiny
OS/Shell Experience	Linux, PowerShell, WSL
Cloud Computing	CentOS 7 HPC
Data Wrangling and Visualization	*tidyverse*, *ggplot2*, Tableau

Version Control	Git and GitHub
Bioinformatic Tools	GATK, samtools, cutadapt, Trimmomatic, *phyloseq* and *microeco*

Peer-Reviewed Publications and Pre-Prints

- Dong, C. M., **Aponte Rolón, B.**, Sullivan, J. K., Tataru, D., Deleon, M., Dennis, R., Dutton, S., Machado Perez, F. J., Montano, L., & Ferris, K. G. (2024, June 29). Short-term fluctuating and long-term divergent selection on sympatric Monkeyflowers: Insights from decade-spanning reciprocal transplants. https://doi.org/10.1101/2024.06.26.600870
- **Aponte Rolón, B.**, Arnold, A. E., Sánchez Juliá, M., & Van Bael, S. A. (2024, April 19). *Evaluating the Role of Endophyte-Rich Leaves in Protecting Tropical Trees Against a Generalist Herbivore and a Pathogen.* https://doi.org/10.1101/2024.04.18.589827
- **Aponte Rolón, Bolívar**, & Perfecto, I. (2023). Between two trees: Environmental effects of *I. micheliana* and *A. latifolia* on leaf litter ants in a coffee agroecosystem. *Ecosphere, 14(2)*, e4442. https://doi.org/10.1002/ecs2.4442
- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal-Chavero, R., De Faria Falcão, J. C., Bonilla-Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez-Hernández, A., Escalante-Jiménez, A. L., Martínez-Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., … MacGregor-Fors, I. (2020). Mexico's Ants: Who are They and Where do They Live? *The Bulletin of the Ecological Society of America, 101(2)*, Mimuluse01666. https://doi.org/10.1002/bes2.1666
- Dáttilo, W., Vásquez-Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez-González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal-Chavero, R., Falcão, J. C. D. F., Bonilla-Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez-Hernández, A., Escalante-Jiménez, A. L., Martínez-Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., … MacGregor-Fors, I. (2020). Mexico ants: Incidence and abundance along the Nearctic–Neotropical interface. *Ecology, 101(4)*, e02944. https://doi.org/10.1002/ecy.2944
- Schmitt, L., **Aponte-Rolón, B.**, & Perfecto, I. (2020). Evaluating community effects of a Keystone Ant, *Azteca sericeasur*, on *Inga micheliana* leaf litter decomposition in a shaded coffee agro-ecosystem. *Biotropica, 52(6)*, 1253–1261. https://doi.org/10.1111/btp.12833

</> Software & Data

- **Aponte Rolón, B.**, Blake, R. E., Berys, C., Gum, J., & Wood-Charlson, E. M. (2025). esipDMP: Data Management for Success. https://doi.org/10.5281/ZENODO.17252143
- **Aponte Rolón, B.**, Kristy, B., & Benucci, G. (2025). BRCore: Provides a set of tools to process and analyze microbial data from Bioenergy Research Centers. Retrieved from https://github.com/germs-lab/BRCore. R package version 0.1.0, commit b3915756f8eef04947597359a2c365349c372a00.
- Rieke, M., & **Aponte Rolón, B.** (2025). Nplyr: A grammar of nested data manipulation. Retrieved from https://jibarozzo.github.io/nplyr/. R package version 0.3.0.

Other Publications

- **Aponte Rolón, B.** (2023). High-Molecular-Weight SPRI-aided DNA extraction fro Mimulus MimulusMimulus * Mimulus Mimulus MimulusMimulusMimulus* (Phrymaceae) leaf tissue. dx.doi.org/10.17504/protocols.io.bp2l6xn8rlqe/v2
- Pérez-Figueroa, O., & **Aponte Rolón, B.** (2020). Clashing Resilience: Competing Agendas for Recovery after the Puerto Rican Hurricanes • SftP Magazine. *Science for the People Magazine*, 23(1). https://magazine.scienceforthepeople.org/vol23-1/clashing-resilience-competing-agendas-for-recovery-after-the-puerto-rican-hurricanes/

Professional Experience

Post-Doctoral Research Associate Jan-2025-Present

Department of Agricultural and Biosystems Engineering, Iowa State University, Ames, IA

- **Developed high-throughput, reproducible pipelines** for large-scale microbiome analysis, enabling robust identification of core and non-core microbial communities across multiple Bioenergy Research Centers (BRCs) using R, parallel computing, and high-performance cluster resources.
- **Author and maintainer of the "BRCore" R package**. Implemented novel methods for core microbiome extraction based on Bray-Curtis dissimilarity and abundance-occupancy modeling, now used as a foundational tool within the Inter-BRC Microbiome project.
- **Enabled cross-center, cross-crop comparative analyses** by standardizing data processing, quality control, and statistical workflows (e.g., ordinations, dbRDA), directly supporting multi-institutional collaboration and increasing analytical consistency.
- **Produced publication-ready visualizations and summary statistics** that revealed robust patterns of core microbial taxa and their ecological drivers, informing both experimental design and biological interpretation within the BRC network.

- **Demonstrated the ecological significance of core taxa**, quantifying their contribution to community dissimilarity and highlighting deterministic versus stochastic assembly processes in plant-microbe interactions.
- **Empowered team members and collaborators** by providing well-documented, reusable code, comprehensive reports, and training, thereby enhancing the overall reproducibility, transparency, and impact of the research program.
- **Accelerated research outputs and scientific communication**, delivering actionable insights and high-quality figures/tables for manuscripts, presentations, and stakeholder reports in the field of microbial ecology and bioinformatics.

Technical Lead & Platform Architect Jan-2025-Present

Earth Science Information Partners - Data Stewardship Committee, Severna Park, MD

- **Technical Lead & Platform Architect for ESIP's "esipDMP: Data Management for Success"**, defined the Quarto-based site architecture and information model, organizing content into clear domains with sidebar search, global TOC, and page navigation for discoverability.
- **Built a clear, efficient front-end on Bootswatch**: customized CSS/SCSS and HTML components to establish consistent layout, typography, and reusable patterns that scale for an open-source community of data practitioners.
- **Operationalized, contributor-friendly workflows and deployment**: architected a GitHub Pages publishing pipeline with deterministic URLs, standardized outputs, and repo-actions/issue templates to streamline PRs and community feedback.
- **Led cross-community collaboration (ESIP Data Stewardship Committee)**, establishing review pathways and content stewardship practices while maintaining a continuously deployed high-signal community-owned public resource.
- **Standardized navigation and content templates to reduce contributor friction and maintenance overhead**, enabling incremental, peer-reviewed additions while preserving a stable, version-controlled site foundation.

Data Scientist 2018-2024

Department of Ecology and Evolutionary Biology, Tulane University, New Orleans, LA

- **Owned experimental design, data collection, analysis and interpretation for 3 research projects** focused on understanding the interactions of fungal symbionts, and host-associated genes, resulting in production of 2 peer-reviewed articles.
- **Developed R, Python, and Bash modules to process genomic and metagenomic data** by applying the DADA2 and USEARCH algorithms for novel fungal discovery.
- **Applied GLMMs, ANOVAs, and clustering algorithms (PCA, LDA) in R** to analyze biological datasets or 3 research projects.

- Executed processing workflows via SLURM on a HPC cluster environment.
- **Collaborated with a team of 6+ members** to develop workflows for troubleshooting genomic data processing pipelines with GATK tools; the resulting workflow is hosted on GitHub.
- **Enhanced R package function features to handle additional diversity measures**; forked and submitted pull request to the open-source "mirlyn" package.
- **Ensured data integrity and reproducibility of statistical analyses**; curated and prepared data for submission to public relational databases.
- **Cleaned, validated and submitted genomic data to public relational databases** NCBI and GenBank.
- **Managed genomic relational databases (100K+ rows and 10+ tables)** and documented data processing and dependencies on GitHub to ensure reproducibility of statistical analyses.
- **Developed and maintained training vignettes to increase team's data analytics and bioinformatic core competencies** in R and Bash to operate in HPC cluster environment and Unix-like systems.
- **Communicated research outcomes to stakeholders and the scientific community** by presenting at 4 national and 2 international conferences.

Product Developer Jan. – May 2024

Connolly Alexander Institute for Data Science, Tulane University, New Orleans, LA

- **Developed and presented a proposal to enhance accessibility to data science tools like Tableau, R, and Python** for university students of all skill levels, utilizing public repositories to host shared resources and curricular materials.
- **Created and managed a GitHub Pages website for CAIDS, supporting curricular applications and offering accessible resources on data science**, including tutorials on version control and introductory R.
- **Led a team of 10 data research interns to develop data literacy workshops** for the broader student body, which grew social media engagement by 150%.
- **Facilitated and led team dynamics with agile strategies** to increase efficiency for the development of workshops and social media strategies.
- **Ensured transfer of knowledge and increased team core competencies** through internal workshops (e.g., introduction to Excel, Intro to Project Management).
- **Assessed the Data Ambassador Council's impact on fostering a data-driven community** on campus and identified the need for enhanced team-building activities and a structured onboarding process to improve program effectiveness.

Coordinator Jan. 2023 – Jan. 2024

Tulanians Who Enjoy R Coding (TWERC), Tulane University, New Orleans, LA

- **Coordinated the R user group** at Tulane University with a membership of approximately 15 - 20 individuals.
- **Facilitated the development of 4-5 R programming language workshops per semester** where students and peers applied coding skills to enhance research methods and tools for academic and professional advancement.
- **Played a pivotal role in informing the state of data science literacy** of members to faculty and staff in order to expand official data science programs and course offerings.

Data Science Instructor Sept. – Dec. 2023

Howard-Tilton Memorial Library, Tulane University, New Orleans, LA

- **Developed and delivered virtual workshops and training material** about version control, data visualization, and R to an audience of 70+ people.
  - Introduction to R - 30+ participants.
  - Introduction to Data Visualization in R - 20+ participants.
  - Introduction to Version Control with Git and GitHub - 20+ participants.

Ecological Data Scientist Aug. 2015 – May 2018

School for the Environment and Sustainability, University of Michigan, Ann Arbor, MI

- **Led a team on a 4-month biological sample collection in Mexico**; designed experiments, coordinated sample QC, data collection, and exploratory data analyses in R.
- **Applied GLMMs, ANOVAs, and PERMANOVA analyses** to understand interactions of ants and leaf litter nutrients in the tropics; visualized results with "ggplot2" in R.
- **Results were published in two articles in high-impact, peer-reviewed journals** and presented at international conferences.

Teaching Experience

Tulane University 2018-2024

Instructor *Howard-Tilton Memorial Library, Tulane University, New Orleans, LA.*

- October 2023 | *Introduction to Version Control with Git and GitHub.* Developed by **B. Aponte Rolón**
- October 2023 | *Introduction to Data Visualization in R.* Developed by **B. Aponte Rolón** .

- October 2023 | *Introduction to R, Part 1.* Developed by Mike Ellis and led by **B. Aponte Rolón**

Teaching Assistant *Department of Ecology and Evolutionary Biology*

- Spring 2024 & Fall 2018 | **Diversity of Life - EBIO 1010**. Dr. Jelagat Cheruiyot
- Fall 2020 - 2023 & Spring 2019 | **Entomology – EBIO 4430/4431**. Dr. Jelagat Cheruiyot
- Summer 2023 | **Tropical Field Biology - EBIO 3780**. Dr. Sunshine Van Bael
- Spring 2023 | **Natural History of Louisiana - EBIO 2330**. Dr. Donata Henry
- Spring 2023 | **Theory and Methods in Ecology and Evolutionary Biology - EBIO 2020**. Dr. Donata Henry
- Spring 2022 | **Insects and Human Interactions – EBIO 2210**. Dr. Jelagat Cheruiyot
- Spring 2021 - Fall 2019 | **Plants and Human Affairs – EBIO 3180/3185**. Dr. Keith Clay
- Spring 2020 | **Plant Biology and Adaptation - EBIO 3590/3591**. Dr. Jelagat Cheruiyot

University of Michigan 2016 - 2017

- Fall 2017 | **NRE 509: Ecology: Concepts and Applications**. Dr. Sheila K. Schueller
- Fall 2016 | **ENVIRON 270: Our Common Future**. Dr. Ivette Perfecto

Guest Lectures 2024

- Fall 2024 | **BIO 395 Introduction to R Programming for Biologists**, Grinnell College

Conference Presentations and Posters

Aponte Rolón, B. (2025 June). *Poster*. "From Granite to Meadow: How Host Genetics and Habitat Shape Foliar Endophyte Communities in Monkeyflowers". Evolution 2025, Athens GA, USA.

Aponte Rolón, B. (2023 June). *Oral Presentation*: "Foliar fungal symbionts in sympatric yellow monkeyflowers along an elevational gradient". Evolution 2023, Albuquerque, NM, USA.

Aponte Rolón, B. (2023 March). *Poster*: "The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA". Collaborators: Kathleen Ferris & Sunshine Van Bael. Tulane Research, Innovation, and Creativity Summit (TRICS), Jung Hotel Grand Hall, New Orleans, LA, USA.

Aponte Rolón, B. (2022 July). *Oral Presentation*: "Interactions between functional leaf traits and foliar endophytes in the defense against natural enemies of tropical trees" (ID: 358). The 58th Meeting of the Association for Tropical Biology and Conservation (ATBC 2022), Cartagena de Indias, Colombia.

Aponte Rolón, B. (2022 May). *Poster*: "The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA". Collaborators: Kathleen Ferris & Sunshine Van Bael. Yosemite Symbiosis Workshop. Wawona, CA, USA.

Aponte Rolón, B. (2020 July). *Graphical Abstract*: "Investigating trade-offs and complementarity between functional leaf traits and foliar endophytic fungi in the defense against plant enemies of tropical woody plants". Collaborators: A. Elizabeth Arnold, and Sunshine Van Bael. The Mycological Society of America's First Virtual Meeting, MSA 2020: Mycology from the Cloud (virtual).

Aponte Rolón, B. (2019 May). *Poster*: "Leaf and Root Endophytes of Mangroves in Southwestern Florida Everglades". Collaborators: Mareli Sánchez Juliá, Edward Castañeda, John Kominoski, & Sunshine Van Bael. Florida Coastal Everglades LTER All Scientists Meeting. Fairchild Tropical Botanic Garden, Miami, Florida.

Aponte Rolón, B. (2017 October). *Poster*: "Quality of leaf-litter and ant assemblages in shade-grown coffee in Chiapas, Mexico", Collaborator: Ivette Perfecto. Student Conference on Conservation Science-New York (SCCS-NY), American Museum of Natural History in New York City, NY, USA.

Aponte Rolón, B. (2017 July). *Poster*: "Impacts of quality of leaf-litter on ant assemblages in shade-grown coffee in Chiapas, Mexico", Collaborator: Ivette Perfecto. 54th Annual Meeting of the Association for Tropical Biology and Conservation, "Ecological and Social Dimensions of Tropical Biodiversity Conservation", Merida, Yucatan, Mexico.

Aponte Rolón, B. (2014 May). *Poster*: "El efecto del Curcumin en la señalización celular de Artritis Psoriática" [The Effect of Curcumin on cell signaling of Psoriatic Arthritis]. (With

Carrero Feliciano, Heysel M.; Hall Laureano, Stephanie; Montes González, Ingrid, PhD.) Annual poster presentation of the American Chemical Society, Puerto Rico Chapter, University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Seminars & Workshops

Delegate (Aug. Sept. 2014): *"Encuentro latinoamericano y caribeño: asamblea intermedia"*. [Intermediate Assembly of the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*]. Quito, Ecuador.

Delegate (October 2013): *"Rumbo a la asamblea intermedia"*. Sponsored by the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*. Santo Domingo, Dominican Republic.

Organizer (August 2013): *"Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico"*. Sponsored by *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*, Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

Workshop Developer (August 2013): *"Educación Popular y Liberación Nacional"* [Workshop on Popular Education and National Liberation] Sponsored by *La Nueva Escuela* at *Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico.* Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

Facilitator & organizer (March 2012): *"Sexto Campamento de Jóvenes: Educando para una nueva Patria"* [Summit on Popular Education Critical Ideologies, Racism & Xenophobia]. La Nueva Escuela, Peñuelas, Puerto Rico.

Organizer (March 2012): *"Debates y perspectivas en la construcción de una reforma universitaria inclusiva"*. Sponsored by Honors Program Student Association (AEPREH), University of Puerto Rico, Río Piedras Campus. Social Sciences Faculty, University of Puerto Rico, Río Piedras Campus, San Juan Puerto Rico.

Round table (July 2012): "Puerto Rico: a brief historical account". Second International Summit *"Entre las Crisis y Otros Mundos Posibles"* of the Transnational Network of Other Knowledges. Sponsored by *Centro de Investigaciones y Estudios Superiores en Antropología Social* (CIESAS), CIDECI Las Casas/ UNITIERRA-Chiapas, San Cristóbal de las Casas, Chiapas, México.

Workshop Developer (September 2010): *"Taller de Educación Popular"* [Workshop on Popular Education]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Workshop Developer (May 2010): *"Taller de Educación Popular y el Movimiento Estudiantil"* [Workshop on Popular Education and the Student Movement]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

Grants and Fellowships

- **Department of Ecology and Evolutionary Biology**
  2020, 2021, 2022 *Tulane University, New Orleans, LA*
  Student Research Grant
- **Office of Graduate and Post-Doctoral Studies**
  2021-2022 *Tulane University, New Orleans, LA*
  OGPS Fellowship
- **Rackham Graduate School**
  2017 *University of Michigan, Ann Arbor, MI*
  Rackham International Research Award
- **Rackham Graduate School**
  2017 *University of Michigan, Ann Arbor, MI*
  Rackham Conference Travel Grant
- **Rackham Graduate School**
  2015 *University of Michigan, Ann Arbor, MI*
  Rackham Master Fellowship

Awards & Honors

- **Exceptional Teaching of an Upper Level Course** May 2024

  Steven P. Darwin Outstanding Teaching Assistant Award
  Tulane University, New Orleans, LA
- **Summer Graduate Award** July 2023

  The Connolly Alexander Institute for Data Science
  Tulane University, New Orleans, LA
- **Travel Award** May 2022 & 2023

  Graduate Studies Student Association
  Tulane University, New Orleans, LA
- **Dean's Travel Award** May 2022 & 2023

  School of Science and Engineering
  Tulane University, New Orleans, LA
- **Jeffrey Lund Forest Ecology Award** April 2017

  School for the Environment and Sustainability
  University of Michigan, Ann Arbor, MI

– Annual award for academic excellence, research capability, and professional promise.