

SEBASTIAN CORREA-GALLEGO

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Research Interests

Evolution and ecology are not subfields of biology — they are its organizing logic, present from the emergence of cellular complexity to the structure of communities in extreme environments. My research interests sit at this intersection: I am drawn to microbial systems as tractable windows into how life assembles, persists, and transforms under ecological and energetic constraint. This includes questions about community organization along environmental gradients, the physiological and molecular strategies that underlie ecological success, and the eco-evolutionary dynamics that connect cellular function to community-level patterns. I am also interested in the quantitative and computational frameworks that make these questions formally tractable, and in connecting field-based inquiry with analytical rigor across biological scales.

Education

Universidad EAFIT, B.Sc. in Biology

2022–2026

GPA: 4.44 / 5.00. Undergraduate researcher in microbial ecology and evolution. Program spanning biological inquiry from molecules to ecosystems, with integrated coursework in data science for the life sciences, scientific innovation, and sustainability.

Research Experience

Visiting Student Intern

Aug 2025–Jan 2026

ECISO Lab, Department of Biological Sciences, Purdue University

- Contributed to the project *Proteome Allocation Rules in Osmotrophic Eukaryotes*, investigating proteome reorganization strategies in non-conventional osmotrophic yeasts (*K. marxianus* and *V. polyspora*) under carbon limitation.
- Designed and operated chemostat and turbidostat cultivation systems to maintain defined metabolic steady states. Executed cell harvesting protocols under controlled carbon regimes.
- Contributed to proteomics-based workflows, including sample preparation and downstream integrative analysis across molecular and cellular scales.

Undergraduate Thesis Researcher

2024–2026

Universidad EAFIT, Advisor: Prof. Nicolás Pinel Peláez, Ph.D.

Thesis: *Cultivable Microbial Community Structure Along a Light Gradient in a Tropical Volcaniclastic Cave*

- Characterized the cultivable microbial fraction of the Organal San Antonio, a tropical volcaniclastic cave at ~2350 m a.s.l. in Támesis, Antioquia, across a light-defined spatial gradient spanning Entrance, Transition, and Dark sectors.
- Found systematic differences in cultivable abundance and community composition across zonation: the aphotic sector supported markedly reduced densities and a distinct morphotype assemblage relative to photic sectors, while the Transition zone harbored a partially unique community of its own.
- Established a first spatially resolved cultivable baseline for an organal-type pseudokarstic cave system, using R2A cultivation and an operational phenotypic crosswalk applied to cave sediment communities.

Research Monitor

Jul 2024–Dec 2024

Universidad EAFIT

- Contributed to the project *Positioning of Microorganisms as Fundamental Actors for the Maintenance of Andean Forests* through scientific systematization, written reporting, and research communication.

Academic Service

Student Director, Research Group on Microbiology and Astrobiology (SIAB) *Oct 2023–May 2025*
Universidad EAFIT, affiliated with the Research Group on Geosciences and Biodiversity (GEBI)

- Led a student research group focused on microbiology, astrobiology, extremophiles, and undergraduate scientific development. Coordinated group projects on cave and thermal spring microbial communities.

Conferences and Presentations

Research Proposal Presentation *2024*
2nd Symposium of Biology, Universidad EAFIT. Awarded Second Place.

Oral Presentation *Jan 2024*
XXIII Encuentro Departamental de Semilleros de Investigación, RedCOLSI, Antioquia, Colombia

Honors and Recognition

Visiting Student Intern, Purdue University (UREP-C Program) *2025–2026*

Undergraduate Scholarship, Comfama and Fundación Fraternidad Medellín *2022*

Certifications and Training

Responsible Conduct of Research (RCR) Training *Aug 2025*
CITI Program, Credential ID 71597371, valid through Aug 2029

Introduction to Artificial Intelligence *Dec 2023*
National Association of State Boards of Accountancy (NASBA)

Technician in Agricultural Sciences *Nov 2021*
Servicio Nacional de Aprendizaje (SENA)

Technical Skills

Laboratory and biological methods: microbial cultivation (including chemostat and turbidostat operation), environmental sampling, ecological field records, morphotype characterization, cell physiology, proteomics sample preparation, and microscopy-based observation.

Quantitative and computational tools: R, Python, Linux/bash, \LaTeX , QGIS, biological data analysis, data visualization, and introductory bioinformatics workflows.

Scientific workflows: scientific writing, research communication, literature synthesis, and figure preparation.

Languages: Spanish (native), English (professional proficiency).

References

Nicolás Pinel Peláez, Ph.D.
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