

# CAROLINA LOBATO




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Düsseldorf, North Rhine-Westphalia, Germany

## EXPERIENCE

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- **Postdoctoral Researcher** Jun 2025 - ongoing  
*Supervision:* Prof. Dr. Björn Usadel  
◦ Institute for Biological Data Science – Heinrich Heine University Düsseldorf  Düsseldorf, Germany
- **University Assistant** Jan 2021 - Dec 2024  
*Supervision:* Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg  
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **Research Assistant** Apr - Dec 2020  
*Supervision:* Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg & Dr. Tomislav Cernava  
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **Research Fellow** Apr 2018 - Nov 2019  
*Supervision:* Prof. Dr. Leonor Morais-Cecílio  
◦ Plant Science and Crop Production – ISA, University of Lisbon  Lisbon, Portugal
- **Research Fellow** May 2017 - Mar 2018  
*Supervision:* Prof. Dr. José Carlos Rodrigues & Dr. Ana Alves  
◦ Forest Ecology – ISA, University of Lisbon  Lisbon, Portugal
- **Graduate Research Intern** Sep 2013 - Jun 2014  
*Supervision:* Dr. Sandra Gamboa  
◦ CERNAS – Polytechnic University of Coimbra  Coimbra, Portugal

## EDUCATION

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- **PhD. Molecular Biosciences and Biotechnology, defended with distinction** Apr 2021 - Mar 2025  
*Supervision:* Univ.-Prof. Dipl.-Biol. Dr.rer.nat. Gabriele Berg  
◦ Institute of Environmental Biotechnology – Graz University of Technology  Graz, Austria
- **MSc. Molecular Biomedicine** 2014 - 2016  
*Supervision:* Prof. Dr. Gabriela Moura  
◦ Institute of Biomedicine – University of Aveiro  Aveiro, Portugal
- **Internship LLLP-Erasmus** May - Sep 2013  
*Supervision:* Prof. MVDr. Vladimír Celer, Ph.D.  
◦ Infectious Diseases and Microbiology – University of Veterinary Sciences Brno  Brno, Czechia
- **BSc. Biotechnology** 2009 - 2013  
*Supervision:* Prof. Dr. Paula Amador  
◦ Higher School of Agriculture – Polytechnic University of Coimbra  Coimbra, Portugal

## TEACHING EXPERIENCE

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- **Guest Lecturer "The Seed Microbiome"** Institute of Environmental Biotechnology  
*Environmental Microbiology Seminar (MOL.963UF)* 2023 & 2024
- **Teaching Assistant** Institute of Environmental Biotechnology  
*Laboratory Course Microbiome Analysis (MOL.972UF)* 2023 & 2024  
*Laboratory Course Environmental Biotechnology (MOL.935UF)* 2023 & 2024  
*Biodiversity and Applied Microbiology Lecture (MOL.731UF)* 2021 - 2024  
*Biodiversity and Applied Microbiology Lecture (PLA.221UF)* 2021 - 2024  
*Laboratory Course Biotechnology (CHE.177UF)* 2021 - 2024  
*Environmental Microbiology Seminar (MOL.963UF)* 2021 & 2022  
*Laboratory Course Microbiology (MOL.209UF)* 2022  
*Laboratory Course Bioinformatics (MOL.923UF)* 2021
- **Undergraduate Preceptor** Higher School of Agriculture  
*Laboratory Course Genetic Engineering* 2013

## RESEARCH MENTORSHIP

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- **Bachelor Students** Institute of Environmental Biotechnology  
◦ Daniel Shelegý 2024  
◦ Matevž Zlatnar 2022  
◦ Anna Mitterrutzner 2021  
◦ Zahra Azizi 2021
- **Master Students** Institute of Environmental Biotechnology  
◦ Daniel Habich 2021-2023  
◦ Daniela Dreisiebner 2021-2023  
◦ Magdalena Egger 2021  
◦ Bettina Semler 2020

## RESEARCH OUTPUT

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### Peer-reviewed Publications

**Lobato C., Abdelfattah A., Berg G. & Cernava T., "Defining the Cultured and Uncultured Bacterial Fractions in Cannabis Seeds"** Environmental Microbiome, 2025

*This study emphasizes the role of microbial abundance and interspecies interactions in seed microbiome culturing and the need for tailored strategies to retrieve seed microorganisms under laboratory conditions.*

**Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "Wild Again: Recovery of a Beneficial Cannabis Seed Endophyte from Low Domestication Genotypes"** Microbiome, 2024

*This study examines the bacterial seed microbiomes of 46 Cannabis genotypes spanning a spectrum of domestication levels and reveals that less domesticated genotypes harbor greater microbial diversity. The study also presents a concrete case of restoration of beneficial microbial alliances lost during domestication.*

**Abdelfattah A., Tack A., Lobato C., Wassermann B. & Berg G., "From Seed to Seed: The Role of Microbial Inheritance in the Assembly of the Plant Microbiome"** Trends in Microbiology, 2023

*This paper proposes a three-stage framework of microbial inheritance, from plant to seed, through seed dormancy, to seedling, and highlights its key role in shaping plant evolutionary potential and host microbiome co-evolution while outlining critical factors influencing assembly at each stage.*

**Inácio V., Lobato C., Graça J. & Morais-Cecílio L., "Cork Cells in Cork Oak Periderms Undergo Programmed Cell Death and Proanthocyanidin Deposition"** Tree Physiology, 2021

*This paper elucidates the cellular and molecular processes underlying first and wound-induced periderm formation in cork oak, revealing shared and distinct pathways of suberization, polyphenolic accumulation and programmed cell death that shape cork's unique protective and industrially valuable tissue.*

### Submitted Manuscripts

**Chen X., Olimi E., Lobato C., Berg G. & Cernava T., "The Tomato Seed Microbiome is Mainly Shaped by Host Genotype and Production Site"** mSystems, 2025

*This research paper demonstrated that plant genotype is the primary driver of the tomato seed microbiome, identifying a small core microbiome and predictive links between host traits, environment, and microbial composition.*

Olimi E., Wuggenig R., Lobato C., Bickel S., Kusstatscher P., Wicaksono W. A., Battisti A., Coyne D., Adriko J., Cernava T. & Berg G., "Linking the Microbiome and Metabolome of *Mondia whitei*, a Medicinal Climber Plant" *Environmental Microbiology Reports*, 2025

*This paper characterizes the root microbiome and metabolome of Mondia whitei, revealing core microbial taxa, geographic signatures, and metabolite-microbe correlations relevant for bio-prospecting.*

## Published Thesis

Lobato C., "The Microbiome of *Cannabis* Seeds: Insights into Microbiome-Driven Sustainability" TU Graz diglib, 2025

Lobato C., "A Study of Alternative Initiation Codons in *Candida cylindracea*" RIA, 2016

## Oral Presentations

Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "Symbiotic Futures: Leveraging Seed Microbiomes for Sustainable *Cannabis* Cultivation", LANDSCAPE, Berlin 2024

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Healthy *Cannabis* Seeds Harness a Geno- and Chemotype Specific Microbial Signature" Slovenian Microbiome Network Symposium (SMNS), Maribor 2023

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Exploring the microbiome of *Cannabis* Seeds Through Domestication and Breeding Stages" 2nd Young AMICI Symposium, 2023 (online)

Lobato C., Cuadros-Patiño K., Cernava T. & Berg G., "Characterization of the *Cannabis* Seed Microbiome for the Development of Improved Cultivation Strategies" Virtual Cannabis Research Conference, 2021 (online)

## Poster Presentations

Lobato C., Freitas J.M., Habich D., Kögl B., Berg G. & Cernava T., "Symbiotic Futures: Leveraging Seed Microbiomes for Sustainable *Cannabis* Cultivation", 5th Plant Microbiome Symposium (PMS), Amsterdam 2024

Lobato C., Freitas J.M., Habich D., Berg G. & Cernava T., "Uncovering *Cannabis* Seed Endophytic Diversity and Composition Across Varieties" 16th Symposium on Bacterial Genetics and Ecology (BAGECO), Copenhagen 2023

Lobato C., Cernava T. & Berg G., "Exploring the *Cannabis* Seed Microbiome" 10th ISS Congress & 3rd International Conference on Holobionts, Lyon 2022

Lobato C., Cernava T. & Berg G., "Exploring the *Cannabis* Seed Microbiome" miCROPe International Symposium, Vienna 2022


Lobato C., Cuadros-Patiño K., Cernava T. & Berg G., "Characterization of the *Cannabis* Seed Microbiome for the Development of Improved Cultivation Strategies" 8th Theodor Escherich Symposium on Medical Microbiome Research (TES) & 4th AMICI Symposium, Graz 2021

Inácio V., Lobato C., Graça J. & Morais-Cecílio L., "How cork cells differentiate: The Role of Programmed Cell Death and Proanthocyanidin Deposition in Cork Oak Periderm" PADiBa, Bonn 2019

Gamboa S., Lobato C., Oliveira H., Oom M.M. & Bahcevandziev K., "Flow Cytometry for the Assessment of Equine Sperm Chromatin" GTIE, Golegã 2015

## SCIENCE OUTREACH

### • Co-founder and Coordinator

Seed Microbiome Working Group (SMWG) 

2022-ongoing

*The group enables early-career researchers to present their work, receive feedback, and build a collaborative academic network to advance seed microbiome science.*

### • Speaker

TU Graz Science Day 2023: New Worlds in Production

Sep 2023

*Science communication seminar "Healthy seed microbiome, healthy Cannabis plants".*

### • Organizer

TU Graz Long Night of Research 2024

May 2024

*Planned and coordinated public engagement activities showcasing microbiome research carried out at the Institute of Environmental Biotechnology.*

[PEC 282](#) - Growth, Cellular Renovation, and Reproduction: From Theory to Practice

2014

*Engaging high school students through lectures and practical activities on recombinant DNA in bacteria, and in animal fertilization.*

### • Session Chair

10th Theodor Escherich Symposium on Microbiome Research (Graz)

Jan 2024

9th Theodor Escherich Symposium on Microbiome Research (Graz)

Nov 2022

PROFESSIONAL DEVELOPMENT & SERVICE

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Workshops & Training

- **CEPLAS workshop: Genome reconstruction from metagenomic data** Sep 2025
- **Reproducible Research with R and quarto: Workflows for data, projects, and publications** Sep 2024
- **Teaching Academy: University Didactics 1 & 2 (Basic Module)** Jul - Sep 2022
- **Bacterial Metagenomics: from experimental design to data analysis** May 2021
- **Code Academy: Learn the Command Line Course** Feb 2021
- **Metagenomics applied to surveillance of pathogens and antimicrobial resistance** Feb 2020
- **Programming Initiation Course for Biologists** Jan 2019
- **Theoretical-practical course in Cytogenetics and Genomics in Diagnosis and Research** Sep 2018

Peer Review

- Environmental Microbiome Journal 2024 - ongoing
- Scientific Reports 2025 - ongoing

ADDITIONAL INFORMATION

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**Languages:** Portuguese (Native), English (Proficient), Spanish (Intermediate), German (A2) **Programming Languages:** R (Experienced), Bash - Unix Shell (Experienced), Python (Beginner) **Driver’s license:** B1 **Hobbies:** Scientific illustration, Basketball