

CAROLINA LOBATO

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Düsseldorf, North Rhine-Westphalia, Germany

EXPERIENCE

- **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

- **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

- **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

• Bachelor Students

Institute of Environmental Biotechnology

- Daniel Shelegy 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

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

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

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) 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

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

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 Amsterdam (PMS), 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), 2023

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

Lobato C., Cernava T. & Berg G., "Exploring the *Cannabis* Seed Microbiome" miCROPe International Symposium 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, 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, 2019

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

SCIENCE OUTREACH

• Co-founder and Coordinator

Seed Microbiome Working Group (SMWG) [🌐]

2022-ongoing

• 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 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

Jan 2024

9th Theodor Escherich Symposium on Microbiome Research

Nov 2022

PROFESSIONAL DEVELOPMENT & SERVICE

Workshops & Trainings

- [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 reviewing

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

ADDITIONAL INFORMATION

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