

CARLOS ANDRÉS DÍAZ RODRÍGUEZ

Email | ORCID | Google Scholar

RESEARCH PROFILE

Microbe-Hunting Engineer & Systems Biologist integrating computational modeling, polyphasic taxonomy, and multi-omics to uncover how microbes shape host biology and ecosystems.

RESEARCH INTERESTS

- Host-Microbe Interactions and Microbial Symbiosis
- Microbiome Biology and Microbial Genomics
- Systems Biology and Multi-Omics Integration
- Genome-Scale Metabolic Modeling

EDUCATION

Gulbenkian Institute for Molecular Medicine | Católica Biomedical Research Centre Oeiras, Portugal
Ph.D. Integrative Biology and Biomedicine 09/2022 - Present

- *Supervisors:* Dr. Luis Teixeira, Dr. Karina Xavier, and Dr. Maria Zimmermann-Kogadeeva.
- *Thesis:* Host-Microbe Metabolic Interactions in *Drosophila melanogaster*.

Universidad de los Andes Bogotá, Colombia
M.Sc. in Biological Sciences – Microbiology 10/2020 - 06/2022

- *Supervisor:* Dr. Diego Jiménez Avella.
- *Thesis:* Polymers-transforming Potential of a Minimal Lignocellulolytic Bacterial Consortium.

Universidad Nacional de Colombia Medellín, Colombia
B.E. in Biological Engineering 04/2014 - 08/2019

SELECTED RESEARCH EXPERIENCE

Católica Biomedical Research Centre (CBR) Oeiras, Portugal
Researcher 02/2023 - Present

- *Project:* Transcriptomic profiling and genome-scale metabolic modeling of the host-microbe interaction between *Drosophila melanogaster* and *Wolbachia*.

European Molecular Biology Laboratory (EMBL) Heidelberg, Germany
Scientific Exchange Visitor 03/2024 - 04/2024

- *Project:* A genome-scale metabolic model to understand *Wolbachia* growth and antiviral protection in *Drosophila melanogaster*.

International Center for Theoretical Physics (ICTP – SAIFR) Sao Paulo, Brazil
Invited Graduate Researcher 06/2021 - 07/2021

- *Project:* A network pharmacology approach to harness the potential of Brazilian biodiversity in polypharmacology against *Leishmaniasis*.

Universidad de Los Andes Bogotá, Colombia
Graduate Research Assistant 06/2021 - 08/2021

- *Project:* Metagenome-assembled genome characterization of a minimal microbial consortium and modeling of a tripartite network for the bioprospection of enzymes with plastic degradation activity.

PROFESSIONAL SERVICE

Peer Reviewer for *Bio-protocols*: Microbiology, Genomics, Transcriptomics, and Metabolic modeling protocols.

MENTORING & LEADERSHIP

Universidad de Los Andes Invited Lecturer & Workshop Facilitator in Bioinformatics.	Bogotá, Colombia 08/2021 - 03/2022
Universidad de Los Andes Graduate Teaching Assistant & Undergraduate Thesis Co-Director in Microbiology.	Bogotá, Colombia 08/2020 - 07/2022
Universidad Nacional de Colombia Undergraduate Teaching Assistant in Chemistry & Biochemistry.	Bogotá, Colombia 08/2018 - 11/2018

HONORS & AWARDS

European Network for Research on Host-Microbe Symbiosis – SymbNET Research Exchange Program (2000 €).	Heidelberg, Germany 03/2024 - 04/2024
Foundation For the Future of Colombia - COLFUTURO Program for Recruitment of Talent (PRT).	Bogotá, Colombia 03/2021 - 06/2023
Universidad de Los Andes Postgraduate Excellence Scholarship (BEPS)) (9600 €).	Bogotá, Colombia 10/2020 - 06/2022
Universidad de Los Andes Funding for Research Projects (1700 €).	Bogotá, Colombia 01/2021 - 06/2022

SCIENTIFIC PUBLICATIONS AND MANUSCRIPTS

Discovery and cultivation of prokaryotic taxa in the age of metagenomics and artificial intelligence. *The ISME Journal*. D. Jiménez, R. Marasco, J. Schultz, **C. Díaz-Rodríguez**, J. Nogales, L. Rodriguez-R, J. Overmann, and A. Soares Rosado. [DOI]

Novel bacterial taxa in a minimal lignocellulolytic consortium and their potential for lignin and plastics transformation. *ISME Communications*. **C. Díaz-Rodríguez**, L. Díaz-García, K. Herrera, N. Tarazona, C. Spröer, L. Rodriguez-R, B. Bunk, J. Overmann, D. Jiménez. [DOI]

Complete Genome Sequence of *Xanthomonas campestris* pv. *campestris* SB80, a Race-4 Strain Isolated from White Head Cabbage in Turkey. *Microbiology Resource Announcements*. S. Erken-Meral, Shaheen Bibi, **C. Díaz-Rodríguez**, J. Menković, A. Bernal, R. Koebnik. [DOI]

Pichia pastoris as a biological platform to produce recombinant proteins: Relevance for development of biotechnological products in Colombia. *Revista Facultad de Ciencias*, 10(1), 20- 44. J. Rosas, **C. Díaz-Rodríguez**. [DOI]

SELECTED ORAL PRESENTATIONS & POSTERS

SymbNET Final International Conference on Host-Microbe Symbiosis. Olhao, Portugal.

SymbNET Summer School on Host-Microbe Symbiosis. Oeiras, Portugal.

SymbNET Metabolomics Workshop for Biologists: Metabolite-data driven stories. Laussane, Switzerland.

TECHNICAL EXPERTISE

Host-Microbe Systems Biology: Dual RNA-seq, differential expression analysis, functional enrichment analyses, statistical modeling in Python & R, workflow development in Linux, HPC environments, SLURM.

Microbial Genomics: Single-genome and Metagenome-assembled genome (MAG) assembly, annotation, and analysis using Illumina, Oxford Nanopore, and PacBio sequencing technologies.

Metabolic Modeling: Genome-scale metabolic modeling using COBRA, CarveMe, Gapseq, and iMAT.

Chemoinformatics: Molecular fingerprinting (SMILES, Tanimoto similarity), RDKit, Network-based analysis.