

Francisco Daniel Davila Aleman

Postdoctoral researcher · Canadian permanent resident

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Background

Experienced Computational Biologist

Advanced experience with Microbial molecular biology, Microbiology laboratory techniques and Next-generation sequencing data analysis, Metagenomic library preparation (Illumina, Linked-Read, and Nanopore technology), Nanopore sequencing, handling of ecological samples (Gut microbiota, water and sediment samples), Arctic field work, DNA extraction protocols, FACS, establishment and optimization of experimental protocol and experimental design.

Job experience

Postdoctoral Researcher

Calgary, AB, Canada

Geomicrobiology Research Group · University of Calgary

March 2022 - Present

Group Leader Dr. Casey Hubert · Geomicrobiology Group

Research projects:

- "Ecological, phenotypic, and evolutionary changes of the Arctic Marine microbiome in response to pollutants"
- "Development of a bioinformatic pipeline for multiomics microbiome analysis and phenotype prediction"

Research duties:

- Conduct NGS and Nanopore sequencing of complex microbial communities.
- Develop bioinformatics pipelines for comprehensive analysis of metagenomic data.
- Write grant applications to support scientific research
- Supervise, mentor, and collaborate with graduate students and post-graduates in laboratory and computational activities.
- Conducting fieldwork in the Canadian Arctic to collect samples and perform on-site microbiome sequencing.

MITACS Postdoctoral Researcher

Calgary, AB, Canada

University of Calgary · BioAro Inc.

December 2023 - November 2024

"Development of a bioinformatic pipeline for Next-generation sequencing microbiome analysis and phenotype prediction: A one Health approach"

Bioinformatician and microbiome analyst

Calgary, AB, Canada

Microbiome and genomics department · BioAro Inc.

March 2023 - December 2024

Research duties:

- Develop bioinformatic pipelines to analyze complex microbiome data and evaluate human health.
- Build bioinformatic software that employs machine learning algorithms for the prediction of age-related diseases.
- Write grant applications to secure funding for the continuation of research objectives.

Competencies

Laboratory competencies

Advanced experience with Microbial molecular biology and Microbiology laboratory techniques, Metagenomic library preparation (Illumina, Linked-Read, and Nanopore technology), Nanopore sequencing, handling of ecological samples (Gut microbiota), DNA extraction protocols, FACS, fish husbandry, protocol establishment, protocol optimization, and experimental design.

Computational competencies

Advance experience with bioinformatics software for the analysis of terabyte-scale DNA Metagenomic and transcriptomic sequencing data, generated from NGS and Nanopore technologies (e.g. Microbial taxonomic classification, microbial genome assembly, within-sample genetic diversity, microbial evolution, and microbial community ecology). · Programming and confident knowledge using **R, Python, Linux/Unix and SLURM workload manager**.

Languages

Spanish (Native), English (C1), and German (A2)

Education

Ph.D. Biology of Ageing · Specialization: Bioinformatics, Microbiome and Ageing

Cologne, Germany

Max Planck Institute for Biology of Ageing · Cologne Graduate School of Ageing Research

Oct. 2017 - Feb. 2022

Group Leader Dr. Dario Riccardo Valenzano · Laboratory of Evolutionary and Experimental Biology of Ageing

· Ph.D. thesis: "Evolution of gut bacterial microbiota throughout host life span"

M.Sc. Integrative Biology · Specialization: Synthetic Biology and Ageing

Irapuato, Gto, Mexico

Center for Research and Advanced Studies of the National Polytechnic Institute

Mar. 2015 - Sept. 2017

Group Leader Dr. Alexander de Luna Fors · Genetic Systems Biology Laboratory

· M.Sc. thesis: "Systematic analysis of the mitochondrial-autophagy activity in yeast chronological-lifespan genetic factors"

B.S. Biotechnological Engineering · Specialization: Plant breeding and genetic modification

Mexico City, Mexico

Professional Interdisciplinary Biotechnology Unit, National Polytechnic Institute (UPIBI- IPN)

Aug. 2010 - Sept. 2014

Group Leader Dr. Noé Valentín Durán Figueroa · Laboratory of Molecular Biology and Biotechnology of RNA

· B.S. thesis: "Molecular markers for the study of ovule development in *Arabidopsis thaliana*"

Professional certification

Metagenomics Bioinformatics

Online course

European Molecular Biology Laboratory · European Bioinformatics Institute (EMBL-EBI)

Nov. - 2020

Genomic Data Science Specialization

Online course

Johns Hopkins University

Jan.- Aug. - 2020

Bacterial Genomes: Comparative Genomics using ARTEMIS Comparison Tool

Online course

Wellcome Genome Campus Advanced Courses and Scientific Conferences

Aug. - 2019

Bacterial Genomes: Accessing and Analysing Microbial Genome Data

Online course

Wellcome Genome Campus Advanced Courses and Scientific Conferences

July - 2019

Good Scientific Practices

Cologne, Germany

Max Planck Institute for Biology of Ageing

Yearly meeting since 2018

Statistical literacy

Cologne, Germany

Max Planck Institute for Biology of Ageing

May - 2018

Scientific writing and communication course

Cologne, Germany

Max Planck Institute for Biology of Ageing

Mar. - 2018

Scientific publications

1. **Davila-Aleman FD**, Bautista M, McCalder J, Jobin K, Murphy S, Else B, Hubert C (2024). Novel oil-associated bacteria in Arctic seawater exposed to different nutrient biostimulation regimes. doi: <https://doi.org/10.1101/2024.03.22.586348>

2. Morabito G, **Davila-Aleman FD**, Valenzano DR (2023). "Assessing Age-Related Decline in Anti-Bacterial Immune Responses Using an Ex-vivo Assay in African Turquoise Killifish (*Nothobranchius furzeri*)".
doi: <https://doi.org/10.1101/2023.11.24.568569>
3. **Davila-Aleman FD**, Popkes M, Valenzano DR (2024). Characterization and genome assembly of the gut microbiota model organism *Nothobranchius furzeri* using short- and long-read sequencing. (*In preparation, PeerJ*)
4. **Davila-Aleman FD**, Seidel J, Grönke S, Partridge L, Valenzano DR (2024). Detecting gut microbiome evolution during host life span implementing longitudinal metagenomic sequencing. (*In preparation*)
5. **Davila-Aleman FD**, Valenzano DR (2019). Microbiome evolution during host aging. *PLoS Pathog* 15(7): e1007727.
<https://doi.org/10.1371/journal.ppat.1007727>
6. **Davila-Aleman FD** & De Luna, A. (2016). El mundo del autocanibalismo celular. *Avance y perspectiva*, 2(2), 42-43.

Academic Awards and Fellowships

Cologne Graduate School of Ageing Research Fellowship

Three-year Ph.D. fellowship - Class 2017

9 Fellowships out of 900 applicants

Cologne, Germany

Oct. 2017 - Sept. 2020

Young Investigator Ph.D. Course

Selected EMBO Workshop

Heidelberg, Germany

14 - 19 Jan. 2019

References

- Prof. Dr. Casey Hubert
Geomicrobiology Group
Biological Science Department - University of Calgary
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- Dr. Dario Riccardo Valenzano
Evolutionary and Experimental Biology of Ageing.
Max Planck Institute for Biology of Ageing
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- Dr. Alexander de Luna Fors
Genetic Systems Biology Laboratory
National Laboratory of Genomics for Biodiversity
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- Dr. Alfredo Heriberto Herrera Estrella
Fungal Development and Gene Expression Laboratory
National Laboratory of Genomics for Biodiversity
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