

Samuel Oliveira, PhD

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Primary Goal: Make synthetic microbial communities and their corresponding artificial environments. The [Oliveira lab](http://oliveiralab.me) investigates the emergence of community complexity and their underlying interactions in varying environmental contexts, identifies their design principles and metrics, and co-designs communities and microfluidic-based environments with collective behaviors to solve real-life problems.

PROFESSIONAL EXPERIENCE

- 2023-date** **(Tenure-track) Assistant Professor in Nanoengineering**
Joint School of Nanoscience & Nanoengineering (JSNN) - Oliveira Lab - oliveiralab.me
North Carolina Agricultural & Technical State University, Greensboro, USA
- 2024-date** **Scientific Advisory Board for Hardware Automation and Microfluidics**
Kepley Biosystems - kepleybiosystems.com - Greensboro, North Carolina, USA.
- 2018-date** **Co-founder in Hardware Automation, Microfluidics, and Biosensors**
Doroth – Biotech Automation for Better Farming – doroth.com.br - Piracicaba, Brazil
- 2022-2023 Research Assistant Professor - ECE Department- Boston University, Boston, USA
2019-2023 Senior Manager - DAMP Lab – damplab.org - Boston University, Boston, USA
2019-2022 Postdoctoral Researcher -Densmore Lab - Boston University, USA
2014-2018 Researcher -Laboratory of Biosystem Dynamics, Tampere University, Finland

EDUCATION

- 2019 Ph.D. in Biomedical Sciences and Engineering, **Tampere University**, Finland
2014 M.Sc. in Bioengineering, **Tampere University**, Finland
2012 B.Eng. in Biotechnology, **Sao Paulo State University**, Sao Paulo, Brazil

FELLOWSHIPS, AWARDS, AND HONORS

- 2024 **NCAT Excellence in Interdisciplinary Research**. Best Team Award, Greensboro, USA.
2023 **The 2nd Best AgriTech Start-up of Brazil Award**. DOROTH, AgriShow-2023, Rib. Preto, Brazil.
2022-2024 **FAPESP Award**, PIPE Invest, Sao Paulo Res. Found. (FAPESP), 1M BRL, Sao Paulo, Brazil
2021-2023 **FINEP Award** - Startup Seed, DOROTH, Sao Paulo, Brazil
2020 **Start-up Acceleration Award**. DOROTH, Braskem, Sao Paulo, Brazil.
2020 **Start-up Acceleration Award**. DOROTH, Open Innovation EMBRAPA-Soja, Parana, Brazil.
2019-2021 **FAPESP Award**, PIPE Fase-2, Sao Paulo Res. Found. (FAPESP), 1M BRL, Sao Paulo, Brazil
2019 **Startup Acceleration and Angel Investment Award**. DOROTH, SEVNA, Minas Gerais, Brazil.
2019 **Best Ph.D. Thesis Award**. Supervisor: A.S. Ribeiro, Tampere University, Finland.
2018 **Ph.D. Grant**, Väisälä Fund, Finnish Academy of Science, Tampere, Finland
2017 **Ph.D. Grant**, Väisälä Fund, Finnish Academy of Science, Tampere, Finland
2017 **Best Idea for Innovative Product**. SmartLID, Sao Paulo City Foundation, Sao Paulo, Brazil
2016 **Ph.D. Grant**, Väisälä Fund, Finnish Academy of Science, Tampere, Finland
2014 **MSc with distinction**, Supervisor: A.S. Ribeiro, Tampere University, Finland.
2013 **MSc. Thesis Scholarship**, DSP, TUT, Tampere, Finland

SELECTED PUBLICATIONS (complete list: <https://scholar.google.com/citations?user=5Plo7w8AAAAJ&hl=en>)

- S.M.D. Oliveira** and D. Densmore (2022) Hardware, Software, Wetware, Co-Design for Synthetic Biology. BioDesign Research. 2022(9794510), 15. DOI: 10.34133/2022/9794510
- T.S. Jones, **S.M.D. Oliveira**, C.J. Myers, C.A. Voigt, and D. Densmore (2022) Genetic Circuit Design Automation with Cello 2.0. Nature Protocols. 17: 1097–1113. DOI: 10.1038/s41596-021-00675-2
- S.M.D. Oliveira**, N.S.M. Goncalves, L. Martins, R. Neeli-Venkata, J. Reyelt, J.M. Fonseca, J. Lloyd-Price, H. Kranz, A.S. Ribeiro (2019) Chromosome and plasmid-borne pLacO3O1 promoters differ in sensitivity to critically low temperatures. Scientific Reports, 9:4486. DOI:10.1038/s41598-019-39618-z

4. **S.M.D. Oliveira**, A. Häkkinen, J. Lloyd-Price, H. Tran, V. Kandavalli, and A.S. Ribeiro (2017) Temperature-Dependent Model of Multi-Step Transcription in Escherichia coli Based on Live Single-Cell Measurements. *PLoS Computational Biology*, 12(10): e1005174. DOI: 10.1371/journal.pcbi.1005174
5. **S.M.D. Oliveira** et al. (2016) Increased cytoplasm viscosity hampers aggregate polar segregation in Escherichia coli. *Molecular Microbiology*, 99(4):686-699. DOI: 10.1111/mmi.13257
6. **S.M.D. Oliveira**, J.G. Chandraseelan, A. Häkkinen, N.S.M. Goncalves, O. Yli-Harja, S. Startceva, and A.S. Ribeiro (2015) Single-cell kinetics of the Repressilator when inserted into a single-copy plasmid. *Molecular Biosystems*, 11:1939-1945. DOI: 10.1039/C5MB00012B
7. J. Mäkelä, M. Kandhavelu, **S.M.D. Oliveira**, J.G. Chandraseelan, J. Lloyd-Price, J. Peltonen, O. Yli-Harja, and A.S. Ribeiro (2013) In vivo single-molecule kinetics of activation and subsequent activity of the arabinose promoter. *Nucleic Acids Research*, 5:1-9. DOI: 10.1093/nar/gkt350

SYNERGISTIC ACTIVITIES

1. Led the development of 5 new services and completed 10 projects for new customers of the DAMP lab, the DNA foundry of Boston University, while working as Program Manager since 2019.
2. Guest Editor for JoVE and Reviewer for Nature Communications, ACS Synthetic Biology, Synthetic Biology Journal, and IEEE Design & Test.
3. Supervised and co-supervised +20 research and engineer staff at Dorothea and DAMP lab, multiple graduate students in their Ph.D. studies, and MSc and undergrad students in Finland and the USA.
4. Education and outreach program instructor/advisor of 14 students for the Undergraduate Research Opportunities Program from BU, and provided educational activities and tours at the DAMP lab.
5. Co-founder of the AgTech start-up DOROTH based in Sao Paulo, Brazil, since 2018.

TECHNICAL HIGHLIGHTS & EXPERTISE

1. Team Leadership in Microfluidics and SynBio Research Programs: Research Program Vision & Technical Plans; Project Management; Writing Proposals, Papers, and Reports. I have conducted programs that delivered world-class, high-risk R&D products to industries globally spread (including FMC, BASF, Bayer, and Philip Morris).
2. Project/Product Development Management: Coordinating current services and conceiving ideas for new services at the DAMP lab; Mentoring research projects for grad students at the CIDAR Lab; Helping with strategical plans for their works; Assisting with cell and molecular biology, Microfluidics, microscopy, image analysis, modeling, and kinetics of genetic circuits.
3. Laboratory Management: Legal documents and administrative matters; Lab operations and maintenance: Forecasting finances, creating annual workbooks and Human Resources; Equipment maintenance and new purchases; Dealing with vendors; Hosting visits and tours; Meeting with potential customers or collaborators; Lab inspections; Biosafety training.
4. Expertise in Microfluidics and Automation: CAD tools (Fusion360, Klayout, 3DuF) for designing microfluidics prototypes; COMSOL for Microfluidics Platforms Design; Arduino-Programming; LIMS Systems (Aquarium) for Lab Management; Liquid Handling Robots (Hamilton, OT2-Opentrons).
5. Expertise in Single-Cell: Fluorescent Probes for Single-Molecule Measurements using Microscopy Techniques, such as Epifluorescence, Confocal, TIRF, and HILO Techniques; Phase-Contrast, D.I.C., and Bright field Microscopy; CellASIC® ONIX Live Cell Microfluidics Platform.
6. Expertise in Computational and Systems Biology: MATLAB Programming; Stochastic Models and Simulations; NGS Data Analysis; Computational Tools for Single-Cell Image and Data analysis.
7. Expertise in Molecular and Cell Biology: NGS RNAseq library preparation and sequencing; Genetic engineering and Cloning; DNA and RNA Extraction and library preparations, Cell transformation and Heterologous Expression in E. coli; Bacterial and Microalgae Cell Culturing; qPCR and Flow cytometry.