Pablo Cárdenas R.

Cambridge, MA, USA • pablo-cardenas.com • pablocarderam@gmail.com

orcid.org/0000-0001-7015-0512 • linkedin.com/in/pablocarderam • twitter.com/pcr_guy

Education

Massachusetts Institute of Technology (MIT) — Cambridge, MA, USA — **Ongoing**
PhD Student, Department of Biological Engineering (GPA: 5.0/5.0)

Universidad de los Andes (Uniandes) — Bogotá, Colombia — **March, 2018**
Bachelor of Science *Summa Cum Laude* in Microbiology, minor in Bioinformatics (GPA: 4.84/5.0)

Research

Department of Biological Engineering, MIT — Cambridge, MA
Graduate Research Assistant — **Sep 2018 ++**

- → Designing molecular and computational tools for transcriptional control, functional genetics, and drug discovery in the malarial parasite *Plasmodium falciparum* (Prof. Jacquin C. Niles)
- → Helped design, model, construct, and test a management system for cell resource sharing in genetic circuits (Prof. Domitilla Del Vecchio, Mechanical Engineering)
- → Designed a mathematical model to complement an *in vitro* study of the efficacy and dynamics of a synthetic probiotic system for prevention of gut infection (Prof. James J. Collins)

Department of Systems Biology, Harvard Medical School — Boston, MA
Undergraduate Researcher — **Feb – Jul 2018**

- → Helped develop computational workflows for analysis of single-cell imaging (Prof. Johan Paulsson)
- → Constructed and applied microfluidic systems to study bacterial physiology and persister cell formation

Eligo Bioscience — Paris, France
Research Intern in Synthetic Biology — **Aug 2017 – Jan 2018**

- → Created DNA constructs and bacterial strains for phage production using CRISPR-Cas9 editing
- → Screened libraries of synthetic phage candidates against bacterial strains

Mathematical and Theoretical Biology Institute, Arizona State University — Tempe, AZ
Undergraduate Researcher — **Jun – Jul 2017**

- → Created a 3D, spatially explicit computational model of bacterial resistance to antibiotics in a biofilm

Department of Biological Engineering, MIT — Cambridge, MA
Undergraduate Researcher — **May – Aug 2016**

- → Assembled CRISPR-Cas9 constructs for gene editing in the malaria parasite (Prof. Jacquin Niles)
- → Created software that automates the design of the genome-editing plasmids being assembled *in vitro*
- → Carried out a computational genome-wide scan and analysis of Cas9 and Cas12a sites in *P. falciparum*

Department of Biological Sciences, Uniandes — Bogotá, Colombia
Undergraduate Researcher — **May 2015 - Aug 2017**

- → Designed and experimentally tested an ODE model of phage-host dynamics (Prof. Martha Vives)
- → Applied Hidden Markov Models to identify phages in human gut metagenomes (Prof. Alejandro Reyes)
- → Led an all-student team to create a statistical model for snakebite forecasting which garnered the Best Project in Biomedical Engineering Award at the May 2015 ExpoAndes Student Fair

Teaching & Mentorship

Department of Biological Engineering (BE), MIT — Cambridge, MA, USA

Coding Fellow, Biological Engineering Data Lab **Mar 2019 ++**

→ Providing 1-on-1 coaching for programming and biological data analysis to undergraduates, graduate students, and postdocs at MIT as one of the initial fellows at the BE Data Lab

Teaching Assistant, Principles of Molecular Bioengineering **Sep – Dec 2019**

→ Assignment and exam design and grading, review lecture sessions, one-on-one tutoring for 40 students (Profs. Ernest Fraenkel and Alan Jasanoff)

Peer Counsellor, BE Resources for Easing Friction and Stress (REFS) **Jan 2018 ++**

→ Providing 1-on-1 confidential counselling for graduate students at MIT BE as a member of the BE REFS
→ Underwent a week-long training course on conflict coaching and support resources for grad students
→ Working with the MIT BE Department leadership and Grad Student Board to improve graduate experience

Department of Biomedical Engineering, Uniandes — Bogotá, Colombia

Teaching Assistant, Quantitative Human Physiology I and II **Jan – Dec 2016**

→ Assignment design and grading, review sessions, and teaching main lectures during professor absences for 100 students (Prof. Juan Manuel Cordovez)

Department of Student Affairs, Uniandes — Bogotá, Colombia

Teaching Assistant, Social Practice Program **Jul – Dec 2015**

→ Trained, guided, and evaluated 60 Uniandes students serving as tutors for low-income high school students (Instructors David Parga and María del Pilar Pérez)

Department of Biological Sciences, Uniandes — Bogotá, Colombia

Teaching Assistant, Parasitology Laboratory **Jan – Jun 2015**

→ Provided review sessions and tutoring, helped develop and grade assignments, and prepared microscope slides (Instructor Laura Tamayo and Prof. Camila González)

Publications

Host Resistance, Genomics and Population Dynamics in a Salmonella *Enteritidis and Phage System.* **2019**

A.V. Holguín, P. Cárdenas, C. Prada-Peñaranda, L. Rabelo Leite, C. Buitrago, V. Clavijo, ... & M.J. Vives. *Viruses, 11*(2), 188.

Cheating the Cheaters: Spatial Dynamics in the Evolutionary Stability of Antibiotic Resistance. **2018**

D. Akman*, L. Callaway III*, P. Cárdenas*, J. Nieve-Silva*, J Chen, B. Espinoza, L. Arriola, C. Castillo–Garsow. Technical report available from MTBI, Arizona State University.

**These authors contributed equally to the work.*

Awards

Summa Cum Laude, top 1% historic graduates in Faculty of Sciences (Uniandes) **Mar 2018**
Best *Saber Pro* Graduate National Exam, Biology (Ministry of Education, Colombia) **Nov 2017**
Ramón de Zubiría Awards (4), top program GPA (Uniandes) **Nov 2015–Oct 2017**
Excellence Awards in Microbiology, Biomedical Engineering, and Biology (Uniandes) **Mar 2014–Oct 2017**
Best Project in Biomedical Engineering, ExpoAndes Innovation Fair (Uniandes) **May 2015**
Alberto Magno Award for incoming students (Uniandes) **Oct 2013**