Pedro Fontanarrosa

Curriculum Vitae

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Education

2022–Present **Postdoctoral Fellow**, *University of Boulder*, Colorado.

2019–2022 **Ph.D. in Biomedical Engineering, Synthetic Biology Track**, *University of Utah*, Utah, *3.8 of 4.0*.

2017–2019 **Master in Bioengineering, Synthetic Biology Track**, *University of Utah*, Utah, *GPA: 3.67 of 4.0*.
Thesis option.

2007–2014 **Licentiate in Biological Sciences, orientation Genetics, Evolution and Ecology**, *University of Buenos Aires*, Argentina, GPA: 8.39 of 10.00.
7-year professional degree program with thesis.

Ph.D. Dissertation

Title *Investigating Genetic Circuit Failures*

Supervisors Professors Chris Myers, Tara Deans, Orly Alter, Yuval Dorfan, Tamara Bidone

Description This dissertation analyzes and develops methods to understand and avoid genetic circuit failures to help in the re-design process of synthetic biology.

Masters Thesis

Title *Automated Generation of Dynamic Models for Genetic Regulatory Networks*

Supervisors Professors Chris Myers, Tara Deans and Orly Alter

Description This thesis work developed an automated model generator which produces dynamic models of genetic regulatory networks and can be used to determine circuit failures.

Title *Sources of life history trait and morphology variability associated with resistance to alkaloids in a cactophilic gender of Drosophila*

Supervisors Professors Ignacio M. Soto, María Isabel Remis, Marcela Karina Castelo, and Ana Laura Carbajal de Fuente

Description This thesis explores the idea that speciation in cactophilic *Drosophila* may be linked to alkaloid presence of different cacti.

Publications

Refereed Journal Articles

Preprints

Peer-reviewed Abstracts, Short Papers, and Conference Proceedings

Technical Reports

Honors & Awards

2017–2019 **Fulbright and Argentine Presidential Fellowship in Science & Technology**, *Funded by the Argentine President's Cabinet and the U.S. Embassy of Buenos Aires. Administered by the Argentine Fulbright Commission with support from LASPAU.*
Pursue a master's degree in the United States starting Fall 2017.

2015 **Research and Communication Excellency Award**, *Ministry of Science and Technology, Argentinean government*, Argentina.
Distinction awarded for excellency in research and communication of research work done under the "Beca Estímulo" scholarship.

2011–2014 **Beca Estímulo (Encouragement Scholarship)**, *Bestower: University of Buenos Aires.*
Research and Development tasks in the field of genetics and ecology.

Experience

Peer Reviews for Academic Journals

2021 **PLOS Computational Biology**, *ISSN : 1553-7358*, SOURCE-WORK-ID: c2f04765-d444-4600-b920-f9221ce4186c.

Research Projects

2018–Present **Synergistic Discovery and Design (SD2)**, *The Defense Advanced Research Projects Agency (DARPA).*
Genetic circuit design for extreme environments enabled by models extracted from petabyte+ perturbation analyses.

Project FA8750-17-C-0229

2013–2014 **International Barcoding of Life**, *(IBOL) Argentina Fund.*
Barcoding of the diversity of arthropod communities associated to cacti decomposition. This demanded the negotiation of permits with the National Park Administration of the Argentinean government, the coordination of an expedition team to spend weeks in the San Juan desert, and the logistics for the collection of conservation of specimens for the barcoding project.

Director Ignacio M. Soto

2012–2013 **Alkaloid resistance in the genus Drosophila: Effects of artificial selection on ecological specialization and evolution of anti-herbivore strategies**, *National Agency for Scientific and Technological Promotion, Argentina.*

Project PICT-2010-2603

2011–2014 **Alkaloid resistance for insects with saprotrophic nutrition: Genetic bases and effects of artificial selection**, *National Secretariat of Science and Technology and the University of Buenos Aires conjoint program (UBACyT)*.

Project 20020100300061

Research Experience

2017–Present **Research Assistantship**, *Chris Myers' Lab, University of Utah*, Utah, USA.

Genetic design automation (GDA) software development, and genetic regulatory network (GRN) design, modeling, and simulation. Specifically:

- GDA tool development: iBioSim
- Development of novel modeling automation techniques
- GRN modeling and simulation
- Design of genetic circuits with specific applications
- Development and maintenance of genetic parts repositories

2010–2014 **Research Assistantship**, *Evolution Laboratory, University of Buenos Aires*, Buenos Aires, Argentina.

In Argentina, research assistantships are earned through a very competitive contest hosted by the Argentinean government.
Responsibilities:

- Maintained isogenetic lines of Drosophila flies
  - Collection of *Drosophila* specimens in National Parks of the province of San Juan, Argentina
  - Coordinated expedition team to recollect cacti tissues
  - Petition of special permits for recollection of protected species' specimens
- Managed statistical programs and data bases
- Trained and supervised new lab members
- Authored and collaborated in the writing of different scientific papers research programs and technical reports for the Argentinean government

Teaching Experience

Fall 2020 **Graduate Teaching Assistant**, *University of Utah*, Utah, USA.

Graduate teaching assistant for Fundamentals of Biomedical Engineering II (BME II). Instructors: Rob MacLeod & Doug Christensen. In charge of discussion groups, homework & exam corrections (4 CR).

2015–2017 **IB & IGCSE Highschool Chemistry Teacher (in English)**, *Northlands School*, Buenos Aires, Argentina.

Taught freshmen, sophomore, junior and senior students (approx. 250). Full time (40 hs. per week). Coordinated and planned Extended Essays in chemical research.

2014–2015 **IB & IGCSE Primary and Highschool Science and Mathematics Teacher (in English)**, *Tarbut School*, Buenos Aires, Argentina.

Taught freshmen, sophomore, junior and senior students (approx. 250). Full time (40 hs. per week). Orchestrated the XXIII and XXIV Mathematical Ingenious Olympiads.

Other

2019–2022 **Synthetic Biology Open Language (SBOL) Editor**, *COMBINE Standards*.

SBOL Editors' primary responsibility is ensuring the effective curation of documents for the community.

SBOL Editors are elected by a community vote and hold weekly meetings to coordinate their execution of these responsibilities.

Detailed responsibilities:

- Equitably representing the community in voting, documents, and guidance of discussion
- Curation and dissemination of the SBOL standards and related documents (including writing, editing, and coordinating changes)
- Maintaining an open and structured process by which members of the SBOL Development Group can modify and improve SBOL standards (including timely implementation of tracking, processing, responding to, and organizing voting on change proposals)
- Ensuring effective development and maintenance of official SBOL software libraries and associated documentation and tutorials
- Coordinating scholarly publications and ensuring proper attribution of contributions
- Running elections and other community votes
- Organization (or delegation) of SBOL Workshops and other events
- Maintaining community infrastructure, including: the SBOL web site, source code repositories, mailing lists

Scientific Conferences

As an expositor

2022 **SEED 2022**, Washington DC, USA.

WORKSHOP: "Software Tools Workshop for GDA design". Authors: **Fontanarrosa, Pedro**; Bücherl, Lukas; Jet Mante; Sai Saminemi; and Myers, Chris J.

2022 **Harmony 2022**, Washington DC, USA.

CONTRIBUTED TALK: "Robustness and Noise for Genetic Circuit Design Choices". Authors: **Fontanarrosa, Pedro**; and Myers, Chris J.

2021 **IWBDA 2021**, Online (virtual).

CONTRIBUTED TALK: "Comparison of Extrinsic and Intrinsic Noise Model Predictions for Genetic Circuit Failures". Authors: **Fontanarrosa, Pedro**; Bücherl, Lukas; and Myers, Chris J.

2020 **COMBINE 2020**, Online (virtual).

CONFERENCE PAPER: "Genetic Circuit Hazard Analysis Using STAMINA". Authors: Bücherl, Lukas; Mante, Jeanet and **Fontanarrosa, Pedro**; Zhang, Zhen; Jepsen, Brett; Roberts, Riley and Myers, Chris J.

2020 **HARMONY 2020**, EMBL-EBI, Cambridgeshire, UK.

Codefest-type meeting, with a focus on development of the standards, interoperability and infrastructure.

2019 **IWBDA 2019**, *Cambridge University*, Cambridge, England.

CONFERENCE PAPER and CONTRIBUTED TALK: "Analyzing Genetic Circuits for Hazards and Glitches". Authors: **Pedro Fontanarrosa**, Hamid Doosthosseini, Amin Espah Borujeni, Yuval Dorfan, Chris A. Voigt, and Chris Myers.

2019 **COMBINE 2019**, *Heidelberg Institute for Theoretical Studies (HITS)*, Heidelberg, Germany.

CONTRIBUTED TALK: "Analyzing Genetic Circuits for Hazards and Glitches". Authors: **Pedro Fontanarrosa**, Hamid Doosthosseini, Amin Espah Borujeni, Yuval Dorfan, Chris A. Voigt, and Chris Myers.

2018 **COMBINE 2018**, *Boston University*, Boston, MA USA.

POSTER: "Dynamic Model Generation in iBioSim". Authors: **Pedro Fontanarrosa**, Hamid Doosthosseini, Tramy Nguyen, and Chris Myers.

2013 **XVI National Congress of Philosophy**, Buenos Aires, Argentina.

ORAL PRESENTATION "Brian Goodwin and the role of genes in the explanation of generative dynamics of some species in relation to the historical development of the notion of natural selection."

2012 **VIII Argentine Congress of Entomology**, San Carlos de Bariloche, Rio Negro, Argentina.

POSTER: "How does the presence of mescaline influence the viability and development times of Drosophila buzzatii isogenic lines with different chromosomal inversions?". Authors: **Fontanarrosa, Pedro**; Mongiardino, Nicolás; Padró, Julián; Soto, Ignacio.

2011 **XVII Argentine Congress of Toxicology**, Tandil, Buenos Aires, Argentina.

POSTER: "Evolutionary eco-toxicology: Lethal and teratogenic effects of natural alkaloids present in the secondary host of cactophilic flies.". Authors: Padró, Julián; Mongiardino, Nicolas; **Fontanarrosa, Pedro**; Carreira, Valeria; Hasson, Esteban; Soto, Ignacio

As an attendant

2021 **COMBINE 2021**, *11-15 October*, online (virtual).

2020 **IWBDA 2020**, *20-24 September*, online (virtual).

2010 **III Ibero-American Congress of Philosophy of Science and Technology** , CABA, Argentina.

2009 **I Reunion of Evolutionary Biology of the Southern Cone**, CABA, Argentina.

Computer skills

Programming PYTHON, JAVA, C++,JAVASCRIPT, R

Writing LaTeX

Web Development HTML, Hugo

Databases SQL

Languages

Spanish Mothertongue

English Proficient *TOEFL ITP: 630 (February 2016)*

Portuguese Intermediate *Conversationally fluent*

French Beginner *Can read & write*