Manuel Lera Ramírez

Personal information

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Languages:

- Spanish (native)
- English (proficient)
- French (intermediate)
- Italian (intermediate)

Software development

Programming languages:

- Python
- C++
- Matlab
- JavaScript
- PHP (personal projects)
- MySQL (personal projects)

Web development:

- HTML/CSS/JavaScript
- Symfony (PHP)
- React (JavaScript)
- FastAPI (Python)
- NGINX
- Cloud (Digital Ocean)

Other:

- Ontology engineering (Protegé)
- Containerisation (Docker)

Academic awards

2016 - Prix Syngenta Crop Protection Monthey
Best academic record in MSc promotion

2014 - Outstanding Achievement Award
Best academic record in Bachelor promotion.

2010 - Excellence in Academic Performance
Best academic record in Baccalaureate promotion.

2010 - Bronze medal at the Spanish National Chemistry Olympics

2010 - Extraordinary Baccalaureate Award
Regional distinction awarded to students with the best academic record in Baccalaureate.

Summary

As a biocurator in PomBase, I work in the standardisation of biological knowledge and use technologies and bioinformatic resources that will be applied in this project. During my research career, I have acquired and applied a broad set of technical and soft skills, including software development, yeast genetic manipulation, and efficient communication with researchers to develop software that suits their needs. These skills, combined with my first-hand experience with the use-case of Genestorian (managing collections of plasmids and strains) will allow me to deliver the proposed objectives.

Experience

▸ **Biocurator in PomBase: University College London, UK** / Apr 2022 - ongoing

- Literature curation in collaboration with authors, documentation of website and tools.
- FYPO Phenotype ontology engineering (Protegé), software development for database quality control (Python) and ontology visualisation (JavaScript).

▸ **Postdoctoral fellow: Institut Curie, Paris, France** / Jan 2021 - Nov 2021

Continuation of my PhD work in the lab of Dr. Phong Tran, described below.

▸ **PhD in Biology: University of Heidelberg, Germany** / Sep 2016 - Dec 2020

Phong Tran Lab, Institut Curie, France / Feb 2018 - Dec 2020

- Fission yeast genetics, live microscopy and image analysis (Python/Matlab) to study microtubule dynamics in the mitotic spindle.
- First author publication measuring microtubule dynamics during anaphase B for the first time in any organism using fission yeast (Lera-Ramirez et al. 2022).
- Coauthor publication developing an analysis pipeline and graphical user interface for the analysis of microscopy movies (Loncar et al. 2020).

François Nédélec Lab, EMBL Heidelberg, Germany / Sep 2016 - Jan 2018

- Analytical modelling (Python/Matlab) and computer simulations (C++) of cytoskeleton mechanics.
- Participation in the development of the simulation software Cytosim, a large C++ project involving multiple developers running for more than 16 years.
- First author publication modelling microtubule sliding (Lera-Ramírez & Nédélec 2019).
- Collaboration with experimentalists extending simulation to model their system (Hannabuss et al. 2019).

▸ **MSc Biochemistry: University of Geneva, Switzerland** / Sep 2014 - Apr 2016

- Master thesis in the laboratory of Prof. Marcos González-Gaitán using live embryo imaging to study oriented cell division during zebrafish development.
- Development of an image analysis pipeline and graphical user interface still used in the lab, which led to coauthorship in Bürgi et al. 2020.

▸ **BSc in Biotechnology: University of Zaragoza, Spain** / Sep 2010 - Jun 2014

- Erasmus scholarship in University of Geneva (Course 2013-2014).
- Bachelor thesis in the laboratory of Prof. Marie-Luce Bochaton-Piallat on circadian expression of actin isoforms in pig endothelial cells.

Awarded funding

- **ELIXIR-UK DaSH Fellowship / Sept 2022 -** link
  Funding and training fellowship to produce training videos for PomBase users.
- **Alan Turing Institute Post-Doctoral Enrichment Award / Jul 2022 -** link
  £2000 to fund expert advice for the development of ShareYourCloning by the Research Software Development Group in UCL.
- **LabEx Transition fellowship / Feb 2021 -** link
  Fellowship to fund part of my postdoctoral stint in Institut Curie
- **H2020 Marie Skłodowska-Curie Actions PhD fellowship / Sep 2016 -** link
  PhD fellowship, part of an International Training Network

Publications

Microtubule rescue at midzone edges promotes overlap stability and prevents spindle collapse during anaphase B
Lera-Ramirez, M., Nédélec, F. J., & Tran, P. T.
eLife (2022) - doi:10.7554/eLife.72630

Theory of antiparallel microtubule overlap stabilization by motors and diffusible crosslinkers
Lera-Ramirez, M. & Nédélec, F.J.
Cytoskeleton (2019) - doi:10.1002/cm.21626

Self-Organization of Minimal Anaphase Spindle Midzone Bundles
Hannabuss, J., Lera-Ramirez, M., Cade, N. I., Fourniol, F. J., Nédélec, F., Surrey, T.
Current Biology (2019) - doi:10.1016/j.cub.2019.05.049

Kinesin-14 family proteins and microtubule dynamics define S. pombe mitotic and meiotic spindle assembly, and elongation
Loncar, A., Rincon, S. A., Ramirez, M. L., Paoletti, A., & Tran, P. T.
Journal of Cell Science (2020) - doi:10.1242/jcs.240234

Ligand Binding to the Collagen VI Receptor Triggers a Talin-to-RhoA Switch that Regulates Receptor Endocytosis
Bürgi, J., Abrami, L., Castanon, I., Abriata, L. A., Kunz, B., Yan, S. E., Lera, M., … van der Goot, F. G.
Developmental Cell (2020) - doi:10.1016/j.devcel.2020.04.015

Ase1 selectively increases lifetime of antiparallel microtubule overlaps.
Krattenmacher, J., Lera-Ramirez, M., Herynek S., Liu X., Neuzil P., Nedelec F.J., Diez S., Braun M., Lansky Z.
Current Biology (submitted August 2022, in revision pending resubmission)

Open Source Software

ShareYourCloning prototype (Personal project) - Link
Prototype of web application to document molecular cloning. JavaScript/React and Python/FastAPI.

Genestorian prototype (Personal project) - Link
A proof of concept prototype not intended for further development. It was used to show researchers an interface that uses links between strains, alleles, plasmids, etc. Built with PHP/Symfony and MySQL.

PomBase allele quality control (PomBase project) - Link
Python pipeline to fix allele descriptions in PomBase to adhere to our nomenclature and verify aminoacid coordinates. Work in progress.

Ontology relationship viewer (PomBase project) - Link
Simple web application (HTML and vanilla JavaScript) to visualise ontology relationships in the browser, and copy relationship maps in MERMAID format to be pasted in GitHub issues.

Cytosim (Contributor) - Link
Computer simulation of cytoskeleton mechanics (C++). I extended it during my PhD, and developed a grammar for syntax highlighting of simulation configuration files.

Univarscatter (Personal project) - Link
A bee swarm plot implementation in MATLAB. More than 1600 downloads from Mathworks, used by others, including in Nature.

eLabFTW (Contributor) - Link
Open Source Electronic Lab Notebook (Docker/PHP/MySQL). Contributed new page view #2370.

BioPython (Contributor) - Link
Bug fix #3881

bbop-graph (Contributor) - Link
JavaScript graph library. Bug fix #6

pydna (Maintainer) - Link
Open Source python cloning library. Recently named maintainer after discussion with lead developer, since it will be used heavily for ShareYourCloning.

Mentorship Programmes

Google Summer of Code 2022 (Mentor) - Link
I mentored a third year Computer Science student to develop a first prototype of a pipeline to extract genotypes from laboratory spreadsheets (prototype of Objective 4 from the proposal).

Open Life Science - 2021 (Mentee) - Link
16-week mentorship programme that trains researchers to become Open Science ambassadors, focusing on inclusion and Open Science. I remain an active member of this community and participate as training session facilitator.