

# Verónica Miró Pina

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Born in Murcia (Spain), February 18<sup>th</sup> 1991

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## Current position

2020 - ... **Postdoc**, *Weghorn's lab*, Centre for Genomic Regulation, Barcelona (Spain).

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## Research Interests

Population genetics, Evolutionary biology, Cancer genomics.

Probability theory, Stochastic processes, Coalescent theory.

Statistical inference, Data-analysis, Simulations, Machine Learning.

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## Previous positions

2018 - 2020 **Postdoc**, *Instituto de Investigaciones en Matemáticas Avanzadas y Sistemas (IIMAS)*, Universidad Nacional Autónoma de México (UNAM).

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## Education

2015 - 2018 **PhD**, *Equilibrium patterns of genetic diversity shuffled by migration and recombination*, LPSM (Sorbonne Université) and CIRB (Collège de France), Advisors : Emmanuel Schertzer and Amaury Lambert.

2013-2014 **Masters (2nd year)**, *Applied Mathematics*, Université Pierre et Marie Curie, Paris 6, with honors.

2012-2013 **Master (1st year)**, *Biology*, École Normale supérieure (Paris).

2011-2012 **Bachelors Degree**, *Biology*, École Normale supérieure (Paris).

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## Publications

### Published papers

2022 **The role of connectivity on COVID-19 preventive approaches**, Miró Pina, V., Navarrete, J., Tobiás, A., Nzabarushimana, E., González Casanova, A. and González Casanova, I., *PLoS ONE*, 17(9): e0273906.

2022 **The symmetric coalescent and Wright-Fisher models with bottlenecks**, González Casanova, A., Miró Pina, V. and Siri-Jégousse, A., *Annals of Applied Probability*, 32(1), 235–268.

2022 **Estimating the time since admixture from phased and unphased molecular data**, Janzen, T., Miró Pina, V., *Molecular Ecology Resources*, 22(3), 908–926.

2021 **Chromosome Painting**, Lambert, A., Miró Pina, V. and Schertzer, E., *Annals of Applied Probability*, 31(2), 826–864.

2020 **The Wright-Fisher model with efficiency**, González Casanova, A., Miró Pina, V. and Pardo, J.C., *Theoretical Population Biology*, 132, 33–46.

2019 **How does geographic distance translates into genetic distance?**, Miró Pina, V. and Schertzer, E., *Stochastic processes and their Applications*, 129(10) 3839-3921.

### Preprints and manuscripts

2022 **Plasmid stability in fluctuating environments: population genetics of multi-copy plasmids**, Miró Pina, V., Hernandez, J.C.R., Siri-Jégousse, A., Peña Miller, R., Palau, S. and González Casanova, A., bioRxiv 2022.03.15.484385, under revision.

2022 **The stochastic speed of coming down from infinity for general Dirichlet Xi-coalescents**, González Casanova, A., Miró Pina, V., Schertzer, E. and Siri-Jégousse, A., aRxiv 2209.13438, under revision.

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## Research Experience

May-July 2015 **Laboratoire de Biométrie et Biologie Évolutive**, University Lyon 1 (Lyon, France), Nicolas Lartillot, Study of an individual-based model of species diversification. Statistical inference, MCMC algorithms

- January- April 2015 **Department of Ecology and Evolutionary Biology, Princeton University**, *Simon Levin's Lab*, Theoretical ecology, Study of the speciation mechanisms.
- February 2014 **SMILE team (Stochastic Models for the Inference of Life and Evolution)**, *CIRB, Collège de France*, Emmanuel Scherter and Amaury Lambert, Study of a population-based model of speciation.
- July 2015
- February -June 2013 **Center for Genomics and Systems Biology, NYU, New York University**, Edo Kussell  
Experimental evolution.
- June-July 2012 **Centro Nacional de Biotecnología, CSIC, Universidad Autónoma de Madrid (Spain)**, Juan Poyatos  
Experimental study of a genetic network in E.coli.

## Teaching experience

- 2022 Supervisor. Larisa Arreola's undergraduate tesis, UNAM.
- 2020 Supervisor. Fernanda López Eslava's undergraduate , UNAM.
- 2020 Supervisor. Amilkar Gazque's undergraduate student, UNAM.
- 2019 Teacher. Probability 2 and Applied mathematics seminar. Undergrad level at UNAM
- 2015-2018 Teaching assistant at Ecole Normale Supérieure (Paris): Mathematics for biologist. Master's level
- 2015-2018 Teaching assistant at Université Pierre et Marie Curie (Paris): Probability, Differential equations, Analysis. Undergrad level.
- 2012-2015 Oral examiner at lycée Henri IV (Paris, France). Undergrad level

## Selected Presentations

- 2022 TAFI (Tumor Allele Frequency Interpreter): a new deep learning tool to reveal the evolutionary history of tumors. Contributed talk, Probgén 2022, Oxford
- 2022 TAFI (Tumor Allele Frequency Interpreter): a new deep learning tool to reveal the evolutionary history of tumors. Poster, WE-Heraeus-Seminar / Evolution of Cancer - Reconstructing the Past, Predicting the Future
- 2021 Estimating the time since admixture from phased and unphased molecular data. Poster SMBE 2021 - Society for Molecular Biology and Evolution
- 2021  $\Xi$ -coalescents arising from population models with bottlenecks. Journées MAS, Institut Denis Poisson, Orléans, France.
- 2021  $\Xi$ -coalescents arising from population models with bottlenecks. Probability seminar, University of Bath, UK (online).
- 2020 The symmetric coalescent. Bernoulli-IMS One World Symposium 2020. Available on YouTube.
- 2019 The symmetric coalescent. Invited talk. CLAPEM 2019, Merida, Yucatan, Mexico
- 2019 A population genetics model to understand plasmid loss and maintenance, segundo taller nacional de Probabilidad y Biología, Cuernavaca
- 2019 The symmetric coalescent. Invited talk. SPA 2019, Chicago, US
- 2019 The symmetric coalescent. MMEE 2019, Lyon, France
- 2019 The symmetric coalescent. Invited talk. Congreso de la Sociedad Matemática Mexicana, Monterrey, México.
- 2019 Spatial models in Population Genetics. Workshop Ecosystem dynamics: stakes, data and models, Institut Pascal, Saclay, France
- 2018 Chromosome Painting. Primer taller nacional de Probabilidad y Biología, Cuernavaca.
- 2018 Chromosome Painting. Saint Flour Probability School France).
- 2017 Chromosome Painting. AIEM - SMBE meeting (regional meeting of the Society for Molecular Biology and Evolution). Lyon (France).
- 2017 How does geographic distance translates into genetic distance? Annual meeting of the French research group 'Theory and Models of Biodiversity' Paris (France).
- 2017 Chromosome Painting. 'Les Probabilités de demain' (young researchers in Probability meeting), IHES (France).
- 2017 How does geographic distance translates into genetic distance? Conference MMEE (Mathematical Models in Ecology and Evolution), London (UK).
- 2016 Chromosome Painting (poster) Conference MCEB (Mathematical and Computational Evolutionary Biology), Montpellier (France).

2016 How does geographic distance translates into genetic distance? ECMTB (European Conference on Mathematical and Theoretical Biology), Nottingham (UK).

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## Other skills

- Computer science Python, R, bash (advanced), C++, Matlab (basics)
- Languages Bilingual in Spanish and French. Fluent in English. Basic knowledge of Catalán
- Organisation 2021-2022. Postdoc representative: member of the CRG postdoc committee, organisation of career related and social events.
- 2015-2016. Student representative: organisation of cultural and social events for the students and postdocs at Collège de France.
- 2011-2012. Student representative: organisation of social events and of the annual gala at Ecole Normale Supérieure.