

Román Zapién-Campos

Marie Skłodowska-Curie Actions & UKRI PostDoctoral Fellow @ University College London

contact

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nationality

Mexican

languages

Spanish - native
English - fluent (C2)

programming

python, julia, R, bash, C++
mathematica & matlab

research interests

ecology & evolution
theoretical modelling
quantitative biology
microbiology

education (*) & research experience

2023 –	University College London <i>PostDoc</i> - Centre for Life's Origins and Evolution Quantitative ecology of microbes & parameter identifiability from partial information data. <i>Advisor:</i> Prof Wenying Shou	London, UK
2022 – 2023 (15 months)	Max Planck Institute for Evolutionary Biology <i>PostDoc</i> Bayesian inference of interactions from microbiome datasets. <i>Advisor:</i> Prof Arne Traulsen	Plön, Germany
2018 – 2021	* Max Planck Institute for Evolutionary Biology <i>PhD</i> IMPRS for Evolutionary Biology <i>Thesis:</i> Modelling the ecology of host-associated microbiomes. <i>Advisor:</i> Prof Arne Traulsen <i>Summary:</i> we developed models to study hosts and their microbiomes. Topics included: the colonization of hosts by microbes, parental inheritance of microbes, and the effect of differences in selection. Methods included: stochastic and differential equations.	Plön, Germany
2015 – 2016	* University College London MRes Biosciences - Computational Biology <i>Coursework:</i> seminars, scientific literature and skills, math. ecology & research project. <i>Thesis:</i> The evolution of Hutchinson's niche & mutualism. <i>Advisor:</i> Dr David Murrell <i>Summary:</i> we developed a spatial model to study the evolution of mutualism, finding that public goods could make communities more resilient to eco-evolutionary hazards.	London, UK
2015 & 2017 (11 months)	Center for Research and Advanced Studies of the IPN (CINVESTAV) Mexico <i>Research intern in Microcosms Community Dynamics.</i> <i>Advisor:</i> Prof Gabriela Olmedo-Álvarez	Irapuato,
2013 (2 months)	CINVESTAV <i>Summer undergraduate research in Microbial Ecology modeling.</i> <i>Advisors:</i> Prof Gabriela Olmedo-Álvarez & Prof Moisés Santillán	Irapuato, Mexico
2012 (6 months)	* Polytechnic University of Madrid <i>Magalhães/SMILE Exchange Semester</i> <i>Coursework:</i> advanced numerical methods, processes optimization, machine learning and neural networks, biomaterials & nanotechnology.	Madrid, Spain
2012 (2 months)	CINVESTAV <i>Summer undergraduate research in Biological Circuitry modeling.</i> <i>Advisor:</i> Prof Moisés Santillán Zerón	Monterrey, Mexico
2011 (2 months)	CINVESTAV <i>Summer undergraduate research in Synthetic Biology.</i> <i>Advisors:</i> Prof Agustino Martínez Antonio & Prof Alexander DeLuna	Irapuato, Mexico

2009 – 2013

*** National Polytechnic Institute (IPN)**

Silao, Mexico

BSc Biotechnological Engineering

Related coursework: microbiology, biochemistry, molecular biology, bioengineering, differential equations, vectorial calculus, probability and statistics, basic physics, thermodynamics, unit operations & industrial process design.

Thesis: The role of the antagonism in the self-assembly of bacterial communities

Advisors: Prof Gabriela Olmedo-Álvarez & Prof Moisés Santillán (CINVESTAV)

Summary: using a cellular automaton we investigated the role of experimentally quantified antagonism to preserve the biodiversity in *Bacillus* communities from an oligotrophic pond in Cuatro Ciénegas - Mexico. This thesis was done from 2014 to 2015.

publications & preprints

1. Gao Y, Pichugin Y, Traulsen A & **Zapién-Campos R** (2025). Evolution of irreversible differentiation under stage-dependent cell differentiation. *Scientific Reports*. doi: 10.1038/s41598-025-91838-8
2. **Zapién-Campos R**, Bansept F, & Traulsen A. (2024). Stochastic models allow improved inference of microbiome interactions from time series data. *PLoS Biology*. doi: 10.1371/journal.pbio.3002913
3. **Zapién-Campos R**, Bansept F, Sieber M, & Traulsen A. (2022). On the effect of inheritance of microbes in commensal microbiomes. *BMC Ecology and Evolution*, 22(1), 1-13. doi: 10.1186/s12862-022-02029-2
4. **Zapién-Campos R**, Sieber M, & Traulsen A. (2022). The effect of microbial selection on the occurrence-abundance patterns of microbiomes. *Interface: Journal of the Royal Society*, 19(187): 20210717. doi: 10.1098/rsif.2021.0717
5. **Zapién-Campos R**, Sieber M, & Traulsen A. (2020). Stochastic colonization of hosts with a finite lifespan can drive individual host microbes out of equilibrium. *PLoS computational biology*, 16(11), e1008392. doi: 10.1371/journal.pcbi.1008392
6. **Zapién-Campos R**, Olmedo-Álvarez G & Santillán M. (2015) Antagonistic interactions are sufficient to explain self-assembly of bacterial communities in a homogeneous environment: ... *Frontiers in Microbiology*. 6:489, 1–9 pp. doi: 10.3389/fmicb.2015.00489

3rd party funding & fellowships

2024 – 2026
Fellowship

Marie Skłodowska-Curie Actions (European Commission & UKRI)

London, UK

236,748.48 EUR

Awarded to applicants (15.8% in 2023) holding a PhD to carry out ambitious postdoctoral research, acquire new skills and develop their scientific career.

2015 – 2016
Fellowship

National Council of Science and Technology (CONACYT)

London, UK

300,000 MXN + 10,560 GBP

Awarded to top ranked Mexican applicants to pursue graduate STEM studies abroad.

2011 - 2013
Scholarship

Interinstitutional Program for the Strengthening of Research and Graduate Studies of the Pacific (Programa Delfín)

Irapuato, Monterrey & Irapuato, Mexico

13,000 MXN (2013), 13,000 MXN (2012) & 13,000 MXN (2011)

Awarded to top ranked BSc applicants for a 2-months internship in a research lab of their choice.

teaching & supervision

2025 (6 days full-time)	Clubes de Ciencia México <i>Enzymath: Studying enzymes between genes and equations.</i> Co-instructor <i>Related activities:</i> prepared and delivered lectures/practicals in modelling, programming and laboratory for 21 high-school & BSc students for an NGO helping youth to follow STEM careers.	Guanajuato, Mexico
2025 (2 lectures)	University College London <i>Data Science Methods in Biology.</i> Lecturer <i>Related activities:</i> lectures, practicals, and grading of year 2 BSc Biological Sciences students.	London, UK
2023 (6 weeks)	Max Planck Institute for Evolutionary Biology <i>Modelling and inference from microbiome data.</i> Supervisor <i>Related activities:</i> supervision of Yan Giencke (MSc) in Prof Arne Traulsen's group.	Plön, Germany
2021 (4 lectures)	University of Lübeck <i>Mathematical biology in action during the covid-19 pandemic.</i> Lecturer <i>Related activities:</i> lectures and review of assignments of students in MSc Mathematics.	Lübeck, Germany
2021 (12 weeks)	Max Planck Institute for Evolutionary Biology <i>Mobility data analysis during the covid-19 pandemic in Germany.</i> Supervisor <i>Related activities:</i> supervision of Carissa Reid (MSc) in Prof Arne Traulsen's group.	Online
2017 (6 weeks)	CINVESTAV <i>Statistics in R workshop.</i> Instructor <i>Related activities:</i> teaching a group of graduate students and staff Statistics and its implementation in R, including: Exploratory Data Analysis, Statistics and R coding.	Irapuato, Mexico
2014 (6 weeks)	CINVESTAV <i>Programming Club: Introduction to Python and R.</i> Instructor <i>Related activities:</i> leading a group of undergrad and grad students to learn programming and scripting skills in Python and R analysing their own data.	Irapuato, Mexico

peer-review for scientific journals

BMC Biology (1x), Journal of Nonlinear Science (1x), Journal of the Royal Society Interface (1x), Molecular Ecology (1x), and PLoS Computational Biology (2x).

organization of scientific events

2022	Max Planck Institute for Evolutionary Biology <i>Mathematical modelling of microbiomes.</i> Co-organizer <i>Related activities:</i> invitation of international speakers, internal and external communication, preparation of a scientific program, chairing and management of the event.	Plön, Germany
2019	Max Planck Institute for Evolutionary Biology <i>Scientific retreat of the doctoral school (IMPRS).</i> Co-organizer <i>Related activities:</i> preparation of a scientific and career development program, invitation of international speakers, internal and external communication, chairing and management of the event.	Oeversee, Germany
2019	Max Planck Institute for Evolutionary Biology <i>Internal symposium (Aquavit).</i> Co-organizer <i>Related activities:</i> preparation of a scientific program, internal communication, chairing and management of the event.	Plön, Germany

scientific outreach

2025	University College London <i>Pint of Science 2025 - Planet Earth @ The Britannia.</i> Co-organizer <i>Related activities:</i> prepared a scientific outreach event in a pub, found, booked and acted as liaison with the venue, designed a scientific program, and hosted the event three evenings.	London, UK
2020 – 2021	Max Planck Institute for Evolutionary Biology <i>Communication of the covid-19 pandemic.</i> Team member <i>Related activities:</i> produced interactive online plots to communicate the current state of the pandemic in Germany and Schleswig-Holstein to the public and government. I also developed a time-lapse map to show the spread of cases across Germany. * We received a letter of acknowledgement from the state governor Daniel Günther.	Plön, Germany
2010 – 2015	National Polytechnic Institute <i>UPIIG's Science Club.</i> Co-organizer <i>Related activities:</i> study and discussion of STEM topics, participation in scholarly events, and organization of seminars led by students and local scientists about their research expertise and the experience of being and becoming a scientist.	Silao, Mexico

talks, conferences & workshops

Invited Talk

2025	CENTURI - University of Marseille <i>Seminar series</i>	Marseille, France
2023	DFG Research Training Group for Translational Evo. Research <i>Seminar series</i>	Plön, Germany
2022	Mexican Society of Mathematics <i>National Congress 2022</i>	Online

Contributed Talk

2025	Gordon Research Conference <i>Stochastic Physics in Biology</i>	Ventura, USA
2024	Max Planck Institute for Evolutionary Biology <i>Developments in Evolutionary Theory</i>	Plön, Germany
2024	University of Warwick <i>Discussions on Microbial Ecology</i>	Warwick, UK
2022	Max Planck Institute for Evolutionary Biology <i>Physical and Chemical Determinants of Biological Evolution</i>	Plön, Germany
2022 (3 weeks)	International Centre for Theoretical Physics <i>Eco-evolutionary Dynamics of Microbial Communities</i>	Trieste, Italy
2022	Max Planck Institute for Evolutionary Biology <i>Meetings on Microbial Ecology and Evolution</i>	Plön, Germany
2019	Max Planck Institute for Evolutionary Biology <i>Evolution of Interacting Populations</i>	Plön, Germany
2016	Society of Mexican Students in the United Kingdom <i>XIV Symposium of Mexican Studies and Students</i>	Edinburgh, UK
2015	Mexican Scientific Society of Ecology <i>V Mexican Congress of Ecology</i>	San Luis Potosi, Mexico

Poster

2025	The Francis Crick Institute <i>INTERPHACE symposium</i>	London, UK
2025	Gordon Research Seminar <i>Stochastic Physics in Biology</i>	Ventura, USA
2024	The Francis Crick Institute <i>London Mathematical Biology Conference</i>	London, UK
2020 & '21	Society for Mathematical Biology <i>eSMB 2020 and SMB 2021</i>	Online
2019 to '21	Max Planck Institute for Evolutionary Biology <i>Internal symposium: Aquavit. (Won best poster in 2019 & 2020)</i>	Plön, Germany and Online
2019	Gordon Research Conference & Gordon Research Seminar <i>Animal-Microbe Symbioses</i>	West Dover, USA
2017	Mexican Association of Microbiology <i>XL National Congress of Microbiology</i>	Guadalajara, Mexico

Participant

2013 (1 week)	Center for Research in Mathematics <i>Summer school on molecular dynamics and quantum chemistry</i>	Guanajuato, Mexico
2012 (1 week)	Center for Research in Mathematics <i>Summer school on mathematical modeling of biological systems</i>	Guanajuato, Mexico
2012 (1 week)	Iberoamerican Society of Bioinformatics <i>International workshops in bioinformatics 2012</i>	Cuernavaca, Mexico