

Román Zapién-Campos

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

contact

romanzapien.github.io
roman.zapien@ucl.ac.uk
ORCID
LinkedIn

nationality

Mexican

languages

Spanish - native
English - fluent (C2)

programming

python, julia, R, bash, C++
mathematica, matlab
LaTeX, markdown
arduino & raspberry pi

research interests

dynamical systems
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 <i>MRes</i> 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 @ University of Guanajuato <i>Enzymath: Studying enzymes between genes and equations.</i> Co-instructor <i>Activities:</i> prepared and delivered lectures/practicals about math modelling, programming and laboratory to 21 BSc & high-school students for an NGO helping youth to pursue STEM careers. | Guanajuato, Mexico |
| 2025 (2 lectures) | University College London <i>Data Science Methods in Biology.</i> Lecturer <i>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>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>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>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>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>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>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>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>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>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>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 (IPN) <i>UPIIG's Science Club.</i> Co-organizer <i>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 (CIMAT) <i>Summer school on molecular dynamics and quantum chemistry</i> | Guanajuato, Mexico |
| 2012 (1 week) | Center for Research in Mathematics (CIMAT) <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 |