

Adriana Lucía-Sanz Curriculum Vitae

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Update: November 9, 2023

Education & professional experience

2020 – now	Postdoctoral fellow , Department of Biological Sciences at Georgia Institute of Technology, Atlanta, GA, USA. Infectious disease dynamics and virus-host co-evolutionary dynamics. Supervised by Prof. Joshua Weitz.
2015–2020	Ph.D. in Molecular Biosciences , Department of Systems Biology at the National Centre for Biotechnology, Madrid, Spain. Computational and formal study of adaptive strategies of viral populations during evolution. Supervised by Prof. Susanna Manrubia (Mark: 10/10).
Jan–April 2018	Internship at the National Center for Biotechnology Information (NCBI), NIH, Bethesda MD, US. Study of the RNA virome. Collaboration in a research project with Prof. Eugene V. Koonin's group
2014 – 2016	BSc in Physics , two years validated, Universidad Autónoma de Madrid, Spain.
2011–2012	MSc in Biophysics , Department of Biophysics and Systems Biology at the Nicolás Cabrera Institute (INC), Universidad Autónoma de Madrid, Spain. Study of non-linear regulation of cellular pathways and its impact on disease and treatment. Supervised by Dr. David G. Míguez. (Mark: 9.2/10).
fall 2011	Short internship at the National Centre for Biotechnology (CNB), Madrid, Spain Refinement of an experimental protocol for an efficient ejection of genetic material for the bacteriophage-T7. Collaboration in a research project of Dr. José L. Carrascosa.
Summer 2011	Short internship at the National Institute for Cardiovascular Research (CNIC), Carlos III, Madrid, Spain. Study of location and expression of proteins using confocal and high-throughput microscopy. Collaboration in a research project supervised by Dr. María Montoya Sánchez. Title: <i>Decipher the molecular mechanism of Rab8 GTPase function in migratory and invasive processes.</i>
2007–2011	BSc in Biochemistry , Department of Environmental Sciences at the Centro de Biología Molecular Severo Ochoa (CBMSO), Madrid, Spain. Development of novel strategies for the control and prevention of viral diseases. Supervised by Dr. Francisco Sobrino Castelló. (Mark: 8.3/10)

Publications

- 2023 [1.] (in preparation) **Adriana Lucia-Sanz**, Shengyun Peng, Chung Yin Leung, Animesh Gupta, Justin R. Meyer and Joshua S. Weitz Linking genotype with phenotype in the bacteriophage λ and host interaction network.
- [2.] Josh M Borin, Justin J Lee, **Adriana Lucia-Sanz**, Krista R Gerbino, Joshua S Weitz, Justin R Meyer. Rapid bacteria-phage coevolution drives the emergence of multi-scale networks. *Science* 382, 674-678 (2023). <https://doi.org/10.1126/science.adi5536>
- [3.] **Adriana Lucia-Sanz**, Andreea Magalie, Rogelio Rodriguez-Gonzalez, Chung-Yin Leung, Joshua S. Weitz. Modeling shield immunity to reduce COVID-19 transmission in long-term care facilities. *Ann. Epidemiol.*, 77: 44–52, <https://doi.org/10.1016/j.annepidem.2022.10.013>.
- 2022 [4.] **Adriana Lucia-Sanz**, Jacobo Aguirre, Aurora Fraile, Fernando García-Arenal, Susanna Manrubia. Defective Subviral Particles Modify Ecological Equilibria and Enhance Viral Coexistence. *Front. Virol.*, 2: 929851, <https://doi.org/10.3389/fviro.2022.929851>.
- [5.] Shashwat Shivam, Guanlin Li, **Adriana Lucia-Sanz**, Joshua S. Weitz. Timescales modulate optimal lysis–lysogeny decision switches and near-term phage reproduction. *Virus Evolution*, 8(1):veac037, <https://doi.org/10.1093/ve/veac037>
- 2018 [6.] Yuri I Wolf, Darius Kazlauskas, Jaime Iranzo, **Adriana Lucía-Sanz**, Jens H Kuhn, Mart Krupovic, Valerian V Dolja, and Eugene V Koonin. Origins and evolution of the global RNA virome. *mBio*, 9(6):e02329-18, 2018. <https://journals.asm.org/doi/10.1128/mBio.02329-18>
- [7.] **Adriana Lucía-Sanz**, Jacobo Aguirre, and Susanna Manrubia. Theoretical approaches to disclosing the emergence and adaptive advantages of multipartite viruses. *Curr. Op. Virol*, 33:89-95, 2018. <https://doi.org/10.1016/j.coviro.2018.07.018>
- 2017 [8.] **Adriana Lucía-Sanz** and Susanna Manrubia. Multipartite viruses: adaptive trick or evolutionary treat? *NPJ Sys. Biol. Appl.*, 2017. <https://doi.org/10.1038/s41540-017-0035-y>
- [9.] Elena Moreno, Isabel Gallego, Josep Gregori, **Adriana Lucía-Sanz**, María Eugenia Soria, Victoria Castro, et. al., Internal disequilibria and phenotypic diversification during replication of hepatitis C virus in a non-coevolving cellular environment. *J. Virol.* 91(10):e02505-16, 2017 <https://doi.org/10.1128/JVI.02505>.
- 2014 [10.] **Adriana L. Sanz** and David G Míguez. Dual R-smads interplay in the regulation of vertebrate neurogenesis. *Neurogenesis*, 1(1):e29529, 2014.

Fellowships & awards

- 2015–2019 **Research Fellowship for Graduate Students (Severo Ochoa Excellence Program)**, Ministry of Economy and Competition of Spain (Secretaría de Estado de Investigación, Desarrollo e Innovación). Order: ECC/1402/2013, July 22nd, Reference: BOE-A-2014-9007, Ayudas para Contratos Predoctorales Severo Ochoa 2014.
- 2011 **Research Fellowship for Undergraduate Students (Cicerone Program)**, National Institute for Cardiovascular Research, CNIC-Carlos III,(Madrid, Spain). Plan de formación CNIC-Jóven
- 2010–2011 **Research Fellowship for Undergraduate Students (Collaboration Program)**. Ministry of Education of Spain. Order: EDU/580/2011, March 10th, Reference: BOE-A-2011-9657, Beca de Colaboración 2010.

Teaching experience

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| 2021–2023 | IOR Foundations in Quantitative Biosciences (BIOL 6750/PHYS 6750), Quantitative Biosciences graduate program at Georgia Institute of Technology. |
| July 2022 | IOR Quantitative foundations of biological concepts , Serrapilheira/ICTP-SAIFR Training Program in Quantitative Biology and Ecology, Sao Paulo, Brazil. Organization: Serrapilheira/ICTP-SAIFR. |
| 2021 | Graduate TA , Fifth Annual Quantitative Biosciences Hands-on Workshop, Quantitative Biosciences graduate program at Georgia Institute of Technology. |
| 2017–2018 | Graduate TA , Experimental Biochemistry I 18214. Department of Molecular Biology at the Universidad Autónoma de Madrid. |

Academic & scientific service and organization

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| since 2023 | Active peer review Journal of the Royal Society Interface. |
| 2022–2023 | Research Faculty Advisory Council volunteering Representative and liaison from the Biological Sciences school of research faculty in the College of Sciences at Georgia Institute of Technology. |
| 2016–2018 | Graduate Students Council volunteering Representative of graduate students of the department of Systems Biology at the National Center for Biotechnology. |
| 2017 – 2018 | Organizing committee Junior Seminar Series at the National Centre for Biotechnology. Keynote speakers: Jaime Iranzo, NCBI/NIH, Bethesda MD, US, The cancer mutation network and the number and specificity of driver mutations. Jan O. Harter, University of Copenhagen, Denmark. Title: DNA methylation in human epigenomes dependent on local topology of CpG sites. |

Presentations in workshops and congresses

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| 2022 | Virus and satellite in ecological coexistence. Serrapilheira/ICTP-SAIFR Training program in quantitative Biology and Ecology. Date: Sep 21 2022. Organización: Dr. Flávia Maria Marquitti and Dr. Ricardo Martinez-Garcia (Sao Paulo, Brazil). Invited speaker. |
| 2022 | Modeling shield immunity to reduce COVID-19 transmission in long-term care facilities, Evolution and Ecology of Infectious Disease 2022. Organization: Emory University. Poster presentation. |
| 2022 | Stochasticity in gene expression, Sixth Annual Quantitative Biosciences Hands-on modeling workshop. Organization: Quantitative Biosciences graduate program, Georgia Tech. Keynote speaker. |
| 2021 | Modeling shield immunity to reduce COVID-19 transmission in long-term care facilities, CMDI - CDC Meeting on Infectious Disease Dynamics. Organization: Center of Microbial Dynamics and Infection - Center for Disease control and prevention, virtual. Oral Presentation. |
| 2019 | Gene sharing network of plant viruses Complex Networks in Life Sciences. Organization: Dr Jacobo Aguirre and Dr Saúl Ares, National. Center for Biotechnology, Alcalá de Henares, Spain. Oral Presentation. |

- 2019 **Perspectives of multipartitism under virus evolution**, 10th Workshop in Virus Evolution. Organization: Prof. Marilyn J Roossinck, Penn State University, State College PN, US. Oral Presentation.
- 2018 **Multipartite viruses: Adaptive trick or evolutionary treat?** VI Congress of Spanish Evolutionary Biology Society. Organization: Dr Cori Ramon Juanpere, Universitat de les Illes Balears, Palma. Oral Presentation.
- 2017 **Virus-satellite associations in viral competitions**, EMBO conference: Quantitative Principles in Biology. Organization: Dr. Alexander Aulehla, Dr. Jordi García-Ojalvo, Dr. Rob Philips, EMBL Advanced Training Centre Heidelberg, Germany. Poster Presentation.
- 2017 **Basics on multipartite genomes** at the Colloquium of the Systems and Synthetic Biology Program: Multi-scale Biological Design. Organization: Prof. Victor de Lorenzo, National Centre for Biotechnology, Madrid. Oral presentation.
- 2017 **The evolutionary strategy of genome fragmentation**. XIV GISC Workshop. Organization: Dr. Inma Leyva, Universidad Rey Juan Carlos, Móstoles, Spain. Oral presentation
- 2016 **17th International Conference on Systems Biology**. Organization: Dr. James Sharpe, Center for Genomic Regulation, Dr. Jordi García Ojalvo, Pompeu Fabra University and Dr. Luis Serrano, Center for Genomic Regulation, Barcelona. Poster presentation.
- 2016 **The evolutionary strategy of genome fragmentation**, Summer Solstice 2016 8th International Conference on Discrete Models of Complex Systems. Organization: Dr. Jose Fernando Mendes, University of Aveiro. Poster presentation.
- 2016 **Hands-on Winter workshop on complex systems 2016**. Organization: Dr. Alberto Antonioni, University Carlos III of Madrid, Dr. Massimo Stella, Institute for Complex Systems Simulation (ICSS) at the University of Southampton. fast project development.
- 2014 **Drug treatment efficiency is governed by non-linear interactions in cellular signaling pathways**, 1st BCAM Workshop on nonlinear dynamics in Biological Systems. Organization: Dr. Bruno Escibano, Basque Center for Applied Mathematics, (Bilbao, España). Poster presentation.
- 2012 **XV Work session for young researchers**. Organization: Nicolás Cabrera Institute, Instituto Universitario de ciencia de materiales Nicolás Cabrera (INC). Poster presentation.

References

- **Joshua S. Weitz** Professor and Clark Leadership Chair in Data Analytics, University of Maryland; Blaise Pascal Chair, Institute d'Biologie Ecole Normale Supérieure (IBENS). email: jsweitz@gatech.edu (jsweitz@umd.edu coming soon). Group site: <http://weitzgroup.biosci.gatech.edu/>
- **Susanna Manrubia** Professor at CSIC, Group of Evolutionary Systems at the Spanish National Biotechnology Centre (CSIC); Interdisciplinary Group of Complex Systems (GISC). Mailing Address: c/ Darwin 3 28049 Madrid, Spain. e-mail: smanrubia@cnb.csic.es. Phone: +34 91 585 4618. Group site: <https://auditore.cab.inta-csic.es/manrubia/home/>
- **Justin R Meyer** Associate Professor and Vice Chair in the School of Biological Sciences, University of San Diego. Mailing Address: Muir Biology Building, Room 2225, 9500 Gilman Drive 0016, La Jolla, CA 92093-0116. Email: jrmeyer@ucsd.edu. Phone (Office): +1 (858) 822-3338. Group site: <https://labs.biology.ucsd.edu/meyer/>