ALEJANDRA RODRIGUEZ VERDUGO

MICROBIAL SYSTEMS ECOLOGY
ETH ZÜRICH AND EAWAG
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Updated: October 2018

PROFESSIONAL ACADEMIC POSITION

2019- **Assistant Professor**, Ecology and Evolutionary Biology, University of California Irvine, Irvine CA, United States.

2015-Present **Postdoctoral Research Fellow**, ETH Zürich, Zürich, Switzerland. Fellow of ACE, the ETH Zürich Center for Adaptation to a Changing Environment.
Advisor: Martin Ackermann

EDUCATION AND TRAINING

2009-2014 **Ph.D. in Biological Sciences**, University of California Irvine, Irvine CA, United States
Dissertation topic: Genetic bases and phenotypic consequences of high-temperature adaptation in *Escherichia coli* (defended in December 2014)
Advisor: Brandon S. Gaut

2012 **Visiting PhD student** with Dr. Olivier Tenaillon at the "Institut National de la Santé et de la Recherche Médicale" (National Institute of Health and Medical Research) INSERM - UMR-S U722 , Paris, France.

2003-2007 **B.Sc. Biology**, National Autonomous University of Mexico (UNAM), Mexico City, Mexico
Bachelor of Science thesis (2006-2008): Seasonal variation in *Pseudomonas* diversity within a fluctuating aquatic system (defended in June 2008)
Advisor: Ana E. Escalante

PUBLICATIONS

PEER REVIEWED PUBLICATION

Cited 603 times to date; h-index: 8; i10-index: 8 (see Google Scholar)

11) Csillery K., **A. Rodríguez-Verdugo**, C. Rellstab, and F. Guillaume. 2018. Detecting the genomic signal of polygenic adaptation and the role of epistasis in evolution. *Molecular Ecology.* 27:606-612

10) A. González-González, S.M. Hug, **A. Rodríguez-Verdugo**, J.S. Patel and B.S. Gaut. 2017 Adaptive mutations in RNA polymerase and the transcriptional terminator Rho have similar effects on *Escherichia coli* gene expression. *Molecular Biology and Evolution.* 34(11):2839-2855

9) **Rodríguez-Verdugo, A.**, J. Buckley, and J. Stapley. 2017. The genomic basis of eco-evolutionary dynamics. *Molecular Ecology.* 26:1456-1464

8) **Rodríguez-Verdugo A.**, O. Tenaillon, and B.S. Gaut. 2016. First-step mutations during adaptation restore the expression of hundreds of genes. *Molecular Biology and Evolution*. 33(1):25-39

7) **Rodríguez-Verdugo A.**, D. Carrillo-Cisneros, A. Gonzalez-Gonzalez, B. S. Gaut, and A. F. Bennett. 2014. Different trade-offs result from alternate genetic adaptations to a common environment. *Proceedings of the National Academy of Sciences of the United Stated of America.* 111: 12121-12126

6) Achaz G., **A. Rodríguez-Verdugo**, B.S. Gaut, and O. Tenaillon. 2014. The reproducibility of adaptation in the light of experimental evolution with whole genome sequencing. In: Landy C. R. and N. Aubin-Horth, editors. Ecological Genomics: Ecology and the Evolution of Genes and Genomes. Netherlands: Springer. p211-231. doi: 10.1007/978-94-007-7347-9_11

5) **Rodríguez-Verdugo A.**, B.S. Gaut, and O. Tenaillon. 2013. Evolution of *Escherichia coli* rifampicin resistance in an antibiotic-free environment during thermal stress. *BMC Evolutionary Biology*. 13:50. doi:10.1186/1471-2148-13-50

4) Tenaillon O., **A. Rodríguez-Verdugo**, R.L. Gaut, P. McDonald, A.F. Bennett, A.D. Long, and B.S. Gaut. 2012. The molecular diversity of adaptive convergence. *Science.* 335: 457-461

3) **Rodríguez-Verdugo A.**, V. Souza, L.E. Eguiarte, and A.E. Escalante. 2012. Diversity across seasons of culturable *Pseudomonas* from a dessication lagoon in Cuatro Cienegas, Mexico. *International Journal of Microbiology*. doi:10.1155/2012/201389

2) Cerritos R., L.E. Eguiarte, M. Avitia, J. Siefert, M. Travisano, **A. Rodríguez-Verdugo**, and V. Souza. 2011. Diversity of culturable thermo-resistant aquatic bacteria along an environmental gradient in Cuatro Ciénegas, Coahuila, México*. Antonie van Leeuwenhoek.* 99: 303-318.

1) Escalante A.E., J. Caballero-Mellado, L. Martínez-Aguila, **A. Rodríguez-Verdugo**, A. González-González, J. Toribio-Jiménez, and V. Souza. 2009. *Pseudomonas cuatrocienegasensis* sp. nov., isolated from an evaporating lagoon in the Cuatro Ciénegas valley in Coahuila, México. *International Journal of Systematic and Evolutionary Microbiology.* 59: 1416-1420

MANUSCRIPTS IN REVISION AND PREPARATION

Rodríguez-Verdugo A., C. Vulin and M. Ackermann. Ecological dynamics of microbial consortia in fluctuating environments. *In revision in Ecology Letters.*

Rodríguez-Verdugo A. and M. Ackermann. Are microbial communities better understood as assemblies of independent organisms or as super-organisms? *In prep.*

Rodríguez-Verdugo A. and M. Ackermann. Evolution destabilizes pair-wise interactions in microbial communities exposed to fluctuating environments. *In prep.*

Tekin E., T.M. Kang, M. Cruz-Loya, **A. Rodríguez-Verdugo**, V.M. Savage and P.J. Yeh. Thermal sensitivities of bacteria systems under stressed and combined stressor conditions. *In prep.*

GRANTS AND FUNDING

2017	Research Grant from the Adaptation to a Changing Environment (ACE), ETH Zürich (CHF 10'000 or approximately € 8'552)
2016-2018	EMBO Long-Term Postdoctoral Fellowship (stipend and health insurance CHF 139'324 total awarded over 2 years or approximately € 119'150)
2015-2018	Adaptation to a Changing Environment (ACE) Postdoctoral Fellowship (total amount to top-up the EMBO fellowship CHF 132'576 or approximately € 113'379)
	CONACYT Postdoctoral Fellowship (USD 24'000; *award declined*)
2014	AGS Travel Grant (USD 400) and ASM Student Travel Grant (USD 500)
2012	Chateaubriand Fellowship (€ 12'600)
2009-2014	UC MEXUS-CONACYT Doctoral Fellowships for Mexican Students (stipend, tuition fees and health insurance USD 157'212 total awarded over 5 years)

TEACHING AND MENTORING EXPERIENCE

2018	Microfluidics for Microbial Ecology (no. 102-1248-00L), ETH Zürich, *Invited Lecturer*
2017	Basic Practical course in Microbiology (no. 701-0220-00L), ETH Zürich, *Laboratory assistant*
2016-2017	Mentoring of a trainee laboratory technician (EFZ) in biology, ETH Zürich.
2016	Basic Practical course in Microbiology (no. 701-0220-00L), ETH Zürich, *Laboratory assistant*
2015	Term Paper 1: Writing (no. 701-1303-00L), ETH Zürich, *Tutor*
2014	BioSci E163: Environmental Microbiology, University of California Irvine, *Teaching assistant*
2014	BioSci 94: From Organisms to Ecosystems, University of California Irvine, *discussion section leader (x3)*
2013	BioSci 94: From Organisms to Ecosystems, University of California Irvine, *discussion section leader (x3)*
2011	BioSci 94: From Organisms to Ecosystems, University of California Irvine, *discussion section leader (x3)*
2008	Biology of Prokaryotes, College of Science, National Autonomous University of Mexico (UNAM), Mexico *Laboratory teacher*
2007	Biology of Prokaryotes, College of Science, National Autonomous University of Mexico (UNAM), Mexico *Laboratory teacher*

PRESENTATIONS

INVITED TALKS

2018 Department of Ecology and Evolutionary Biology, **University of California Irvine**, United States, March 2018, "Evolution of microbial communities in complex environments."
Department if Ecology and Evolutionary Biology, **University of California Los Angeles**, United States, February 2018, "Evolution of microbial communities in complex environments."

2017 Center for Genomic Sciences, **National Autonomous University of Mexico**, Cuernavaca, Mexico, November 2017, "Evolution of microbial communities in complex environments."

2015 Department of Cell and Molecular Biology, **Uppsala University**, Uppsala, Sweden, April 2015**,** "Genetic bases and phenotypic consequences of *Escherichia coli* adaptation to thermal stress."
Microbial Ecology, Evolution and Genomics Minisymposium, **ETH Zürich**, Zürich, Switzerland, March 2015**,** "Genetic bases and phenotypic consequences of *Escherichia coli* adaptation to thermal stress."

CONFERENCE PRESENTATIONS

2018 II Joint Congress on Evolutionary Biology, Montpellier, France, August 2018. **Oral presentation** "Evolution destabilizes pair-wise interactions in microbial communities exposed to fluctuating environments."
Center for Adaptation to a Changing Environment (ACE) final conference, Horgen, Switzerland, February 2018. **Oral presentation** "Eco-evolutionary dynamics of microbial consortia in fluctuating environments"

2017 Gordon Research Seminar (GRS) and Gordon Research Conference (GRC) on Microbial Population Biology, Andover, United States, July 2017. **Poster presentation** "Evolution of metabolic interactions in microbial communities exposed to fluctuating environments."

2016 Experimental Evolution and Community Dynamics EECD Conference, Max Planck Institute for Evolutionary Biology, Plön, Germany, September 2016. **Oral presentation** "Evolution of metabolic interactions in microbial communities exposed to fluctuating environments."
Center for Adaptation to a Changing Environment (ACE) conference, Ascona, Switzerland, June 2016. **Oral presentation** "Evolution of metabolic interactions in multispecies biofilms exposed to fluctuating environments."

2015 6th Swiss Microbial Ecology Meeting (SME), Ascona, Switzerland, September 2015. **Oral presentation** "First-step mutations during adaptation to thermal stress shift the expression of thousands of genes back toward the pre-stressed state."
Society for Molecular Biology and Evolution (SMBE) annual meeting, Vienna, Austria, July 2015. **Poster presentation** "Early adaptive mutations restore the ancestral gene expression state during thermal stress adaptation."

2014 1st American Society of Microbiology (ASM) Conference on Experimental Microbial Evolution, Washington, DC, United States, June 2014. **Oral presentation** "The genetic bases of fitness trade-offs in *Escherichia coli*."
Society of Molecular Biology and Evolution (SMBE) annual meeting, San Juan, Puerto Rico, June 2014. **Oral presentation** "The genetic bases of fitness trade-offs in *Escherichia coli*."

2013 Society for Molecular Biology and Evolution (SMBE) annual meeting, Chicago, United States, July 2013. **Poster presentation** "Fitness trade-offs and reduction of the lower thermal limit after thermal stress adaptation of *Escherichia coli*."

2012 Society for Molecular Biology and Evolution (SMBE) annual meeting, Dublin, Ireland, June 2012. **Poster presentation** "Parallel evolution of *rpoB* mutants of *Escherichia coli* during thermal stress adaptation

French-American Workshop, MINATEC, Grenoble, France, June 2012. **Oral presentation** "Opportunities for American Students to come in France for a research experience: Chateaubriand fellowship."

DEPARTMENTAL SEMINARS

2015 Center for Adaptation to a Changing Environment (ACE) seminar series, ETH Zürich, Zürich, Switzerland, November 2015. "Metabolic interactions in a bacterial community exposed to fluctuating environments."

2013 Winter Ecology and Evolutionary Biology Graduate Student Symposium, University of California, Irvine, United States, February 2013. "Evolution of *Escherichia coli* rifampicin resistance in an antibiotic-free environment during thermal stress adaptation."

2011 Winter Ecology and Evolutionary Biology Graduate Student Symposium, University of California Irvine CA, United States, January 2011. "Emergence and evolution of antibiotic resistance as a collateral response to thermal stress."

OTHER MERITS

AWARDS

2017 MBE Best Student Paper Award 2016 (USD 2'000)

2014 Dr. William F. Holcomb Scholarship (USD 2'000)

2013 Miguel Velez Scholarship (USD 10'000)

FEATURED RESEARCH

2013 **Commentary** on "Evolution of *Escherichia coli* rifampicin resistance in an antibiotic-free environment during thermal stress" paper by Schenk M.F. and A.GM. de Visser. 2013. Predicting the evolution of antibiotic resistance. *BMC Biology*, 11:14
Press release "Stressed bacteria become resistant to antibiotics" Feb 22, 2013, http://www.sciencedaily.com/releases/2013/02/130221194045.htm

2012 **Faculty of 1000 Biology** evaluation on "The molecular diversity of adaptive convergence" paper by Yuri Wolf and Natalya Yutin, Feb 15, 2012, http://f1000.com/13700958

SERVICE

2015-present Reviewer for *Environmental Microbiology Reports (x1), Molecular Biology and Evolution (x2), The ISME Journal (x4), Evolution (x1), PeerJ (x1), mSphere (x1), Frontiers in Microbiology (x1).*

2017	Organizing committee member for the Symposium on "Detecting the Genomic Signal of Polygenic Adaptation and the Role of Epistasis in Evolution", Zürich, Switzerland.
2014	Co-organizer of the 2014 Winter Ecology and Evolutionary Biology Graduate Student Symposium, Irvine CA, United States
2011	Graduate Student Representative, UCI EEB graduate admissions committee.

LANGUAGES

Fluent in Spanish (mother language), English and French.

REFERENCE CONTACT INFORMATION

Postdoctoral Advisor:

Martin Ackermann, Associate Professor, Department of Environmental Systems Science, ETH Zürich, Zürich, Switzerland, Telephone: +41 58 765 51 22, Email: martin.ackermann@env.ethz.ch

Ph.D. Advisor:

Brandon S. Gaut, Professor, Department of Ecology and Evolutionary Biology, University of California Irvine, Irvine, United States, Telephone: (949) 824-2564, Email: bgaut@uci.edu

Ph.D. Co-Advisor:

Olivier Tenaillon, Professor, French Institute for Medical Research (INSERM) and University Paris Diderot, Paris, France, Telephone: 33 (0) 1 57 27 75 04, Email: olivier.tenaillon@inserm.fr

B.Sc. Advisor:

Ana E. Escalante, Associate Professor, Laboratorio Nacional de Ciencias de la Sostenibilidad (LANCIS), Instituto de Ecología, Universidad Nacional Autónoma de México, Mexico City, Mexico Telephone: +52 (55) 623 0222 ext. 37714, Email: aescalante@iecologia.unam.mx