Mauricio Cruz Loya

Assistant Professor, Aarhus University

Academic Employment

2026–present **Assistant Professor (Tenure Track)**, *Department of Animal and Veterinary Sciences, Aarhus University*, Foulum, Denmark

2022–2026 **Postdoctoral Scholar**, *Department of Biology, Stanford University*, Stanford, California, USA
PI: Erin Mordecai

Education

2015–2022 **PhD in Biomathematics**, *Department of Computational Medicine, David Geffen School of Medicine, University of California, Los Angeles*, Los Angeles, California, USA
Advisor: Van Savage

2015-2016 **MS in Biomathematics**, *Department of Biomathematics, David Geffen School of Medicine, University of California, Los Angeles*, Los Angeles, California, USA
Advisor: Van Savage

2009-2015 **BS in Basic Biomedical Research (Honors)**, *School of Medicine, National Autonomous University of Mexico*, Mexico City, Mexico
Thesis advisor: Gabriel del Rio

Honors and Awards

Postdoctoral

2022-2024 **PRISM Baker Fellowship**
Stanford University

Graduate

2020-2021 **Dissertation Year Fellowship**
Graduate Division, University of California Los Angeles

2015–2020 **UC-MEXUS Conacyt Fellowship**
Joint fellowship from the Mexican National Council of Science and Technology and the University of California Institute for Mexico and the United States

2015-2019 **University Fellowship**
Graduate Division, University of California Los Angeles

Viborg, Denmark
mcruzloya@anivet.au.dk

2015-2016 **Graduate Dean Scholar Award**
Graduate Division, University of California Los Angeles

Undergraduate

Fall 2012 **Coca-Cola Fundación UNAM Scholarship**
Full scholarship for studying abroad at UCSD during Fall 2012 awarded by my undergraduate institution (UNAM).

Invited Presentations

2025 **MAA MathFest**
Sacramento, CA, USA. Invited speaker at the "Mathematical insights at different biological scales" special session in the MathFest conference of the Mathematical Association of America.

Previous Research Experience

2022-2026 **Postdoctoral research, Mordecai Lab, Stanford University**
Research combining mathematical modeling, geospatial weather data and lab experimental data to improve our understanding of the transmission of West Nile virus. Some projects were conducted in collaboration with Alex Ciota's group at the Arbovirus lab in New York State. I also mentored two graduate students on developing machine learning models for West Nile virus vector populations and human cases. We had the best performing model on the 2024 open WNV forecasting challenge by the California Department of Public Health.

2015-2022 **PhD dissertation, Van Savage Lab, UCLA**
Mathematical and computational approaches to study how antibiotics interact with temperature and other stressors, such as nutrient limitation and pressure. These projects were done in close collaboration with the Pamela Yeh lab at UCLA, which provided the experimental data.

2009-2013 **Undergraduate lab rotations, UNAM**
Four yearly rotations as an undergraduate at the National Autonomous University of Mexico at various dry and wet labs. These rotations were under Carolina Escobar (year 1, neuroscience of circadian rhythms in rats), Gabriel del Rio (year 2, homology modeling of proteins and year 4, network analysis of proteins) and Luis Vaca (year 3, calcium channel cell biology through fluorescence microscopy).

Teaching Experience

Winter 2022 **Tutor. Undergraduate Research Center, UCLA**
Designed problem sheets and taught problem-solving workshops as support for students from underrepresented backgrounds in the LS 30A and 30B (Mathematics for Life Scientists) series at UCLA.

Fall 2021 **Teaching assistant. LS30A Mathematics for Life Scientists, UCLA**

Course that serves as an alternative to the traditional calculus sequence for lower division life science undergraduates at UCLA. Compared to a traditional calculus course, LS30A focuses more on biological applications, differential equations and programming and reduces emphasis on algebraic and analytic computations.

Spring 2021 **Teaching assistant. CaSB150 Biological modeling: Mathematical and computational approaches, UCLA**

Course teaching mathematical and computational approaches to study biological systems for upper division undergraduates in the Computational and Systems Biology program at UCLA.

Summer 2015 **Undergraduate instructor. Statistics and R programming, UNAM**

Designed and taught a short 2-week course in R programming and practical statistics to undergraduates of the Basic Biomedical Science program of the National Autonomous University of Mexico under the supervision of Tzipe Govezensky (statistics professor in the program).

Peer-reviewed publications

[1] Elif Tekin, Cynthia White, Tina Manzhu Kang, Nina Singh, **Mauricio Cruz-Loya**, Robert Damoiseaux, Van M Savage, and Pamela J Yeh. Prevalence and patterns of higher-order drug interactions in Escherichia coli. *npj Systems Biology and Applications*, 4(1):31, 2018.

[2] **Mauricio Cruz-Loya***, Tina Manzhu Kang*, Natalie Ann Lozano, Rina Watanabe, Elif Tekin, Robert Damoiseaux, Van M Savage, and Pamela J Yeh. Stressor interaction networks suggest antibiotic resistance co-opted from stress responses to temperature. *The ISME Journal*, 13(1):12, 2019.

[3] Alejandra Rodríguez-Verdugo, Natalie Lozano-Huntelman, **Mauricio Cruz-Loya**, Van M Savage, and Pamela J Yeh. Compounding effects of climate warming and antibiotic resistance. *iScience*, page 101024, 2020.

[4] Elif Tekin, Eleanor S Diamant, **Mauricio Cruz-Loya**, Vivien Enriquez, Nina Singh, Van M Savage, and Pamela J Yeh. A new framework to measure stressor interactions. *Ecology Letters*, 23(9):1391–1403, 2020.

[5] Natalie A Lozano-Huntelman, April Zhou, Elif Tekin, **Mauricio Cruz-Loya**, Bjorn Østman, Sada Boyd, Van M Savage, and Pamela Yeh. Hidden suppressive interactions are common in higher-order drug combinations. *iScience*, 24(4):102355, Apr 2021.

[6] **Mauricio Cruz-Loya***, Elif Tekin*, Tina Manzhu Kang*, Natalya Cardona, Natalie Lozano-Huntelman, Alejandra Rodriguez-Verdugo, Van M

Savage, and Pamela J Yeh. Antibiotics shift the temperature response curve of Escherichia coli growth. *mSystems*, 6(4):e00228–21, 2021.

[7] **Mauricio Cruz-Loya***, Benjamin B Chu*, Jacqueline Jonklaas, David F Schneider, and Joseph DiStefano, 3rd. Optimized replacement T4 and T4+T3 dosing in male and female hypothyroid patients with different BMIs using a personalized mechanistic model of thyroid hormone regulation dynamics. *Front. Endocrinol. (Lausanne)*, 13:888429, July 2022.

[8] Rachel L. Fay, **Mauricio Cruz-Loya**, Alexander C. Keyel, Dana C. Price, Steve D. Zink, Erin A. Mordecai, and Alexander T. Ciota. Population-specific thermal responses contribute to regional variability in arbovirus transmission with changing climates. *iScience*, 27(6):109934, June 2024.

[9] Rachel L. Fay, **Mauricio Cruz-Loya**, Joseph G. Maffei, Erin A. Mordecai, and Alexander T. Ciota. Rising temperatures contribute to West Nile virus diversification and increased transmission potential. *Scientific Reports*, 15(1):25016, July 2025.

[10] **Mauricio Cruz-Loya**, Erin A. Mordecai, and Van M. Savage. A flexible model for thermal performance curves. *Ecology*, 107(2), February 2026.

[11] Johannah E. Farner, Kelsey P. Lyberger, Lisa I. Couper, **Mauricio Cruz-Loya**, and Erin A. Mordecai. Nonlinear effects of temperature on mosquito parasite infection across a large geographic climate gradient. *Ecology*, 107(2), February 2026.

[12] Samantha B. Sambado, Váleri N. Vasquez, **Mauricio Cruz-Loya**, Johannah E. Farner, Rachel L. Fay, Samantha J. Bents, Joshua E. Lazaro, Talya Shragai, Isabel Delwel, Desire U. Nalukwago, and Erin Mordecai. Agriculture–urban interfaces, social vulnerability and climate change shape West Nile virus risk across the United States. *Biology Letters*, 22(10), October 2026.

Preprints

[1] Rachel L. Fay, **Mauricio Cruz-Loya**, Elyse M. Banker, Erin A. Mordecai, and Alexander T. Ciota. Mosquito infection-mediated trait variation alters temperature-dependent transmission of West Nile virus. *bioRxiv*, August 2026.

* Denotes equal contribution