

Catherine A. Hernandez

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Professional Appointments

- 2026-present Assistant Professor, Department of Biological Sciences, University of South Carolina
2021-2025 Postdoctoral Fellow at Yale University, Department of Ecology & Evolutionary Biology
Advisor: Dr. Paul E. Turner
Project: “Viral communities in a warming world.” Exploring the effects of abiotic change on bacteria-phage interactions and evolution using field, lab, and computational approaches.

Education

- PhD 2021 **University of California, Berkeley (Berkeley, CA)**
Doctor of Philosophy in Integrative Biology
Advisor: Dr. Britt Koskella
Dissertation: “The relevance of context in the ecology and evolution of phage interactions with the bacterial plant pathogen *Pseudomonas syringae*”
- BS 2014 **University of Miami (Coral Gables, FL)**
Bachelor of Science in Biology, *summa cum laude*
Advisor: Dr. Alexandra C. C. Wilson
Honors Thesis: “The temporal and spatial expression of an amino acid transporter gene in asexual pea aphid embryos”

Fellowships, Grants, and Awards

- 2021-2025 Yale Institute for Biospheric Studies (YIBS) Gaylord Donnelley Postdoctoral Environmental Fellowship and National Science Foundation (NSF) Postdoctoral Research Fellowship in Biology (\$146,000 and \$138,000, respectively)
2016-2021 NSF Graduate Research Fellowship (\$138,000)
2015-2020 Berkeley Fellowship for Graduate Study (approx. \$85,000)
2017-2020 UC Berkeley Integrative Biology Department Summer Research Award (\$8441 total)
2020 Sigma Xi Berkeley Chapter Grants in Aid of Research (\$472)
2019 Plantae Conviron Seeding Discovery Competition Semi-Finalist
2019 ASM Microbe Outstanding Abstract Award
2019 Carl Storm Underrepresented Minority Fellowship (to attend Microbial Population Biology Gordon Research Conference)
2018 Australia-Americas PhD Research Internship Program (to work with Dr. Jeremy Barr, Monash University)
2010-2014 University of Miami Foote Fellow
2014 Phi Beta Kappa
2012-2013 Howard Hughes Medical Institute (HHMI) Exceptional Research Opportunities Program (EXROP) and Capstone (to work with Dr. Daniel Bolnick, University of Texas at Austin)

Publications

*Indicates undergraduate co-author

9. **Hernandez, C. A.**, Delesalle, V. A., Krukoni, G. P., DeCurzio, J. M.*, & Koskella, B. 2024. Genomic and phenotypic signatures of bacteriophage coevolution with the phytopathogen *Pseudomonas syringae*. *Molecular Ecology* 33(10):e16850. doi: [10.1111/mec.16850](https://doi.org/10.1111/mec.16850)
8. Koskella, B., **Hernandez, C. A.**, and Wheatley, R. M. 2022. Understanding the Impacts of Bacteriophage Viruses: From Laboratory Evolution to Natural Ecosystems. *Annual Review of Virology* 9:57-78. doi: [10.1146/annurev-virology-091919-075914](https://doi.org/10.1146/annurev-virology-091919-075914)
7. Debray, R., Socolar, Y., Kaulbach, G.*, Guzman, A., **Hernandez, C.A.**, Curley, R.*, Dhond, A.*, Bowles, T. and Koskella, B. 2022. Water stress and disruption of mycorrhizas induce parallel shifts in phyllosphere microbiome composition. *New Phytologist* 234(6):2018-2031. doi: [10.1111/nph.17817](https://doi.org/10.1111/nph.17817)
6. Bichet, M. C., Chin, W. H., Richards, W., Lin, Y.-W., Avellaneda, L., **Hernandez, C. A.**, Oddo, A., Chernyavskiy, O., Hilsenstein, V., Neild, A., Li, J., Voelcker, N. H., Patwa, R. and Barr, J. J. 2021. Bacteriophage uptake by mammalian cell layers represents a potential sink that may impact phage therapy. *iScience* 24(4):102287. doi: [10.1016/j.isci.2021.102287](https://doi.org/10.1016/j.isci.2021.102287)
5. Bartlett, L. J., Boots, M., Brosi, B. J., de Roode, J. C., Delaplane, K. S., **Hernandez, C. A.**, Wilfert, L. 2021. Persistent effects of management history on honeybee colony virus abundances. *Journal of Invertebrate Pathology* 179:107520. doi: [10.1016/j.jip.2020.107520](https://doi.org/10.1016/j.jip.2020.107520)
4. **Hernandez, C. A.**, Salazar, A. J.*, and Koskella, B. 2020. Bacteriophage-mediated reduction of bacterial speck on tomato seedlings. *PHAGE* 1(4):205-212. doi: [10.1089/phage.2020.0027](https://doi.org/10.1089/phage.2020.0027)
3. **Hernandez, C. A.**, and Koskella, B. 2019. Phage resistance evolution *in vitro* is not reflective of *in vivo* outcome in a plant-bacteria-phage system. *Evolution* 73:2461-2475. doi: [10.1111/evo.13833](https://doi.org/10.1111/evo.13833)
Associated digest in *Evolution*: Wagner, K.-S., and Rajkov, J. 2019. Lab *versus* nature: Disease resistance evolution differs between environments.
2. Maciejewski, M. F., **Hernandez, C. A.**, and Bolnick, D. I. 2019. Investigating the association between armor coverage and parasite infection in an estuarine population of stickleback. *Evolutionary Ecology Research* 20:69-82.
1. Morella, N. M., Yang, S. C.*, **Hernandez, C. A.**, and Koskella, B. 2018. Rapid quantification of bacteriophages and their bacterial hosts *in vitro* and *in vivo* using droplet digital PCR. *Journal of Virological Methods* 259:18-24. doi: [10.1016/j.jviromet.2018.05.007](https://doi.org/10.1016/j.jviromet.2018.05.007)

Preprints

3. **Hernandez, C. A.**, Cha, J.*, Houpt, N. S. B., Antani, J. D., and Turner, P. E. 2026. Prophage activity shapes the thermal ecology and evolution of a marine bacterial host. (bioRxiv, doi: [10.64898/2026.02.19.706829](https://doi.org/10.64898/2026.02.19.706829)).
2. Houpt, N. S. B., **Hernandez, C. A.**, and Turner, P. E. 2026. Mutations in filamentous bacteriophages spark eco-evolutionary feedbacks in *Pseudomonas aeruginosa*. (bioRxiv, doi: [10.64898/2026.01.21.699487](https://doi.org/10.64898/2026.01.21.699487)).

1. Shim, K. C., Weber, J. N., **Hernandez, C. A.**, and Bolnick, D. I. 2022. Population genomics of a threespine stickleback tapeworm in Vancouver Island. (bioRxiv, doi: [10.1101/2022.05.15.491937](https://doi.org/10.1101/2022.05.15.491937))

Presentations

Invited talks

- 2026 University of Georgia Center for Ecology of Infectious Diseases, Athens, GA
“Phages as drivers of host thermal ecology and evolution”
- 2025 University of South Carolina Department of Biological Sciences, Columbia, SC
“From warming to freezing: bacteria-phage interactions in a changing world”
- 2025 University of Miami Department of Biology, Coral Gables, FL
“From warming to freezing: bacteria-phage interactions in a changing world”
- 2025 Rice University Department of BioSciences, Houston, TX
“Bacteria-phage ecology and evolution in a changing world”
- 2024 University of Florida Department of Microbiology and Cell Science, Gainesville, FL
“From warming to freezing: temperature as a driver of bacteria-phage ecology and evolution”
- 2023 University of Wisconsin-Madison Department of Bacteriology, Madison, WI
“From warming to freezing: temperature as a driver of bacteria-phage ecology and evolution”
- 2021 American Phytopathological Society Plant Health 2021, virtual
“Impacts of bacteriophages on plants: from environmental microbiomes to pathogen biocontrol”
- 2020 Georgia Tech Center for Microbial Dynamics and Infection Seminar Series, virtual
“Exploring bacteria-phage interactions and coevolution in the phyllosphere”
- 2019 BioRad Droplet Digital PCR technical seminar, Berkeley, CA
“ddPCR as a tool for studying bacteria-phage interactions *in vitro* and *in vivo*”
- 2018 Monash University Microbiology Group Seminar, Melbourne, VIC, Australia
“Bacteria-phage interactions and evolution *in planta* and *in vitro*”

Contributed presentations (* indicates oral, † indicates poster)

- 2025 *†ASM Microbe, Los Angeles, CA
†Gordon Research Conference on Microbial Population Biology, Andover, NH
- 2024 *Yale EEB Postdoc Symposium, New Haven, CT
*Evolution Annual Meeting, Montreal, Canada
†Yale Climate Day, New Haven, CT
†Princeton Center for Theoretical Science Workshop (Bacteria versus Phage: The Main Event), Princeton, NJ
- 2023 *Yale EEB Postdoc Symposium, New Haven, CT
†Gordon Research Conference on Microbial Population Biology, Andover, NH
- 2022 *Connections Across Borders: microbial communities at the interface between ecology and evolution, Mexico City, Mexico
†Evolution Annual Meeting, Cleveland, OH
- 2021 *Yale Institute for Biospheric Studies Seminar Series, New Haven, CT
- 2020 *Microbial Ecology and Evolution Virtual Conference (MEEVirtual)
- 2019 *†Gordon Research Conference and Seminar on Microbial Population Biology, Andover, NH
*†ASM Microbe, San Francisco, CA
†Bay Area Ecology and Evolution of Infectious Disease, Stanford, CA
- 2017 †Stanford Microbiome Summit, Stanford, CA
- 2014 †University of Miami Research, Creativity, and Innovation Forum, Coral Gables, FL
- 2013 †HHMI EXROP Annual Meeting, Chevy Chase, MD

Teaching Experience

UC Berkeley – Graduate Student Instructor

- Coevolution: from genes to ecosystems (Spring 2020)
 - Facilitated weekly discussion section and lecture activities for upper-level undergraduates.
- Introductory cell, molecular, and organismal biology lab (Fall 2019)
 - Taught two weekly lab sections covering introduction of topics such as cell structure and motility, photosynthesis, and basic anatomy and physiology.
- Introductory ecology, evolution, and plant biology lab (Fall 2016)
 - Co-taught one weekly lab section covering topics such as phylogenetics, species interactions, and ecosystems.

University of Miami – Undergraduate Teaching Assistant

- HHMI introductory biology lab (Spring 2013, Spring 2014)
 - Prepared materials and facilitated in-lab activities for this course-based undergraduate research experience (CURE).

Guest Lectures

- Yale University, Microbial Ecology (October 28, 2025)
Instructor: Dr. Martina Dal Bello
“Viral Ecology”
- Yale University, Ecology and Evolution of Infectious Disease (April 7, 2022)
Instructors: Dr. Vanessa Ezenwa and Dr. Paul Turner
“Branching out: a canopy-level view of concepts in the ecology and evolution of plant diseases”

Professional Service

Manuscript Reviews

Applied Soil Ecology, Ecology and Evolution, Virus Evolution, eLife, The ISME Journal, Microbial Genomics, PHAGE: Therapy, Applications, and Research, Molecular Ecology, Evolution Letters, PLOS Biology, Current Microbiology, Nature Communications

Grant Reviews

Ad hoc reviewer (NSF DEB), Panelist (NSF DBI)

Departmental and Society Service

- American Society for Microbiology In-Depth Symposium Convener (2025)
 - Title: “Phage ecology: from prophage decision making to ecosystem modulation”
- Society for the Study of Evolution Graduate Student Advisory Committee (2022-2023)
 - Planning and running events at the annual Evolution meeting, including the postdoc fellowship application networking lunches and the pre-meeting natural history museum tour
 - Reviewer for the Graduate Research Excellence Grant (GREG) R. C. Lewontin Award (Spring 2022, Spring 2023), Early-Career Vocational Opportunities Workshops Grant (Spring 2022), Rosemary Grant Advanced Award (Fall 2022, Fall 2023)
- UC Berkeley Integrative Biology Department Graduate Student Association Committee (2017-2018)
 - Planning and running social events for the Integrative Biology community, including weekly socials, monthly research chalk talks, the annual cookie bake-off (Fall 2017) and art and

science show (Spring 2018)

Thesis Committees

- Bri Glendening (Master's thesis, College of Charleston, 2025-2026)

Society Memberships

American Society for Microbiology, Society for the Study of Evolution

Mentoring and Outreach

Research Mentoring

- Yale University: Jaime J. Cha (Yale First Year Summer fellow, Spring 2023-present), Kieren L. Dykstra (YIBS SURES program, Summer 2023 and 2024), Kennedy Mitchell (STARS Program, Summer 2022)
- UC Berkeley: Aspen Pastore (URAP Program, Fall 2018-Spring 2022), Sophie Zhai (URAP Program, Spring 2019-Spring 2021; senior thesis mentor), Kore Lum (URAP Program, Fall 2017-Fall 2019), Andrea Salazar (NIH Bridge to Baccalaureate Program, Summer 2019), Priyanka Ranade (Summer 2016-Spring 2018), Reena Debray (Amgen Scholars Program, Summer 2017)
- University of Miami: Brianna Valdes (HHMI Research Training Program, Spring 2015-Summer 2015), Lily Acheampomaa-Piasare (Spring 2015)

Non-Research Mentoring

- Women in Science at Yale Mentoring Program (2021-2023)
 - Served as a postdoctoral mentor for four STEM graduate students at Yale. Meeting regularly to discuss research, academic life, career transitions, and other topics.
- EEB Mentor Match Program (2020, 2022, 2023)
 - Meeting regularly with recent graduates and providing advice on searching for graduate programs, contacting possible advisors, and preparing application materials.
- UC Berkeley LAGSES (Latino/a Association of Graduate Students in Engineering and Science) Graduate Fellowship Application Mentor (2017, 2019)
 - Providing feedback on graduate fellowship application materials.

Community Outreach

- Expanding Your Horizons (EYH) Recruitment, Materials, and Publicity Committee (2019-2021)
 - Contacting and visiting local schools to promote the one-day EYH STEM conference (Berkeley, CA) for middle school girls.
- Bay Area Scientists in Schools (2019)
 - One-hour visits to first grade classrooms with a lesson on animal traits and habitats.
- EYH Logistics Volunteer (2018, 2019)
 - Directed parents to the parent workshop location and sorted post-attendee surveys.
- Be a Scientist Program (2016)
 - Guided students as they ran and interpreted science experiments over a six-week span at Willard Middle School (Berkeley, CA).

Professional Development (Attendee)

- Ohio State University Viromics Workshop (2022)
 - Three-day workshop at Ohio State University (Columbus, Ohio) introducing participants to the

field of viromics and available tools (primarily focused on viral metagenomics analyses).

- Graduate Student Inclusivity Training through the UC Berkeley Restorative Justice Center (2021)
 - Series of four workshops training graduate students how to use the principles of restorative justice to promote inclusivity in their communities. Using these skills, I developed a community building workshop for labs, which I facilitated in the Spring 2021 Koskella lab retreat.
- Joint Berkeley Initiative for Microbiome Sciences (JBIMS) workshops (2020)
 - Series of three workshops at UC Berkeley: “Theory for Microbiome Research”, “Model Systems for Microbiome Research”, “Data Science Practices in Microbiome Research”
- ReclaimingSTEM Diversity, Equity, and Inclusion Workshop Series (2020)
 - Series of four virtual workshops with active discussions about topics such as decolonial theory, disability in STEM, and advocacy in academia.
- Georgia Tech QBioS Epidemics Modeling Workshop (2020)
 - Hands-on modeling workshop teaching principles and methods of running SIR models, taught virtually by instructors at GA Tech.
- NSF-funded Research Mentoring Workshops (Bring out the Best in your Undergraduate Researchers: Teaching & Mentoring in Physical & Life Science Research Groups; 2019)
 - Series of five workshops at UC Berkeley training graduate students in evidence-based strategies for undergraduate research mentoring, with active discussions and assignments. Workshop participants implemented these strategies with their summer mentees and brought reflections for discussion each week.
- Teaching Workshops through the UC Berkeley Center for Teaching & Learning (2015)
 - Series of four workshops titled: “Developing a Statement of Teaching Philosophy”, “How Students Learn”, “Syllabus and Course Design”, “Working with Student Writing”

References

1. Dr. Paul E. Turner, Rachel Carson Professor of Ecology and Evolutionary Biology at Yale University
Contact: paul.turner@yale.edu
2. Dr. Britt Koskella, Associate Professor at the University of California, Berkeley
Contact: bkoskella@berkeley.edu
3. Dr. Jeremy J. Barr, Associate Professor at Monash University
Contact: Jeremy.Barr@monash.edu