

ELISA VISHER

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TRAINING

STANFORD UNIVERSITY

SEPTEMBER 2022-PRESENT

Postdoctoral Researcher in the Departments of Genetics and Biology

Advisors: Dmitri Petrov and Gavin Sherlock

Project: "Investigating the genetic and evolutionary dynamics producing patterns of trade-off conditionality"

UNIVERSITY OF CALIFORNIA, BERKELEY

AUGUST 2016-AUGUST 2022

PhD in Integrative Biology

GPA: 4.0/4.0

Advisor: Mike Boots

Committee: Britt Koskella, Erica Bree Rosenblum

Thesis: "Effects of Structured Host Genetic Diversity on Infectious Disease Evolution"

UNIVERSITY OF MICHIGAN, ANN ARBOR

AUGUST 2014-AUGUST 2016

Research Technician in the Department of Infectious Diseases

PI: Adam Lauring

Project: "The mutational robustness of influenza A virus"

YALE UNIVERSITY

FALL 2010-SPRING 2014

BS Biology (Intensive)/BA Anthropology (Honors)

GPA: 3.57/4.0

Biology Advisor: Paul Turner

Biology Thesis: "Characterization and Experimental Evolution of Thermotolerance in the Cystoviridae Family of Bacteriophage Virus"

Anthropology Advisor: Brenda Bradley

Anthropology Thesis: "Evidence of Molecular Aging in the Mitochondria of Sifaka Lemurs"

PUBLICATIONS

Visher, E., Uricchio, L., Bartlett, L., DeNamur, N. ^U, Yarkan, A. ^U, Alhassani, D. ^U, Boots, M. (2021). The Evolution of Host Specialization in an Insect Pathogen. *Evolution*.

Guth, S., Mollentze, N., Renault, K., Streicker, D. G., **Visher, E.**, Boots, M., & Brook, C. E. (2022). Bats host the most virulent—but not the most dangerous—zoonotic viruses. *PNAS*.

Visher, E., Evensen, C., Guth, S., Lai, E. ^U, Norfolk, M. ^U, Rozins, C., Sokolov, N.A., Sui, M. ^U, & Boots, M. (2021). The Three Ts of Pathogen Evolution During Zoonotic Emergence. *Proceedings of the Royal Society B*, 288(1956), 20210900.

Visher, E., & Boots, M. (2020). The problem of mediocre generalists: population genetics and eco-evolutionary perspectives on host breadth evolution in pathogens. *Proceedings of the Royal Society B*, 287(1933), 20201230.

Bartlett, L. J.*, **Visher, E.***, Haro, Y.^U, Roberts, K. E., & Boots, M. (2020). The target of selection matters: An established resistance—development-time negative genetic trade-off is not found when selecting on development time. *Journal of evolutionary biology*, 33(8), 1109-1119.

Guth, S., **Visher, E.**, Boots, M., & Brook, C. E. (2019). Host phylogenetic distance drives trends in virus virulence and transmissibility across the animal–human interface. *Philosophical Transactions of the Royal Society B*, 374(1782), 20190296.

Iritani, R., **Visher, E.**, & Boots, M. (2019). The evolution of stage-specific virulence: Differential selection of parasites in juveniles. *Evolution Letters*, 3(2), 162-172.

Visher, E.*, Whitefield, S. E.*, McCrone, J. T., Fitzsimmons, W., & Luring, A. S. (2016). The mutational robustness of Influenza A virus. *PLoS pathogens*, 12(8), e1005856.

Pre-prints

Visher, E., Mahjoub, H., Soufi, K., Pascual, N., Hoang, V., Bartlett, L. J., ... & Boots, M. (2022). The evolution of host resistance to a virus is determined by resources, historical contingency, and time scale. bioRxiv, 2022-09.

* denotes co-first author ^U denotes undergraduate mentee author

APPOINTMENTS

NSF POSTDOCTORAL RESEARCH FELLOW, STANFORD UNIVERSITY FALL 2022-PRESENT

Funded for my project "Investigating the genetic and evolutionary dynamics producing patterns of trade-off conditionality" through the Rules of Life program.

PRISM-BAKER POSTDOCTORAL FELLOW, STANFORD UNIVERSITY FALL 2022-PRESENT

Funded for my project "Investigating the genetic and evolutionary dynamics producing patterns of trade-off conditionality".

GRADUATE STUDENT RESEARCHER, BOOTS LAB, UC BERKELEY SPRING 2020-SUMMER 2022

Appointed as a named GSR on NSF-DEB 2011109 "US-UK Collab: Heterogeneities, Diversity and the Evolution of Infectious Disease" to help set up experiments in the *Plodia interpunctella* system looking at spatial structure and genetic diversity. Contributed to editing the grant.

PHILOMATHIA FELLOW, BOOTS LAB, UC BERKELEY FALL 2020-SUMMER 2022

Funded on my thesis project "*Effects of Structured Host Genetic Diversity on Infectious Disease Evolution*"

NSF GRADUATE RESEARCH FELLOW, BOOTS LAB, UC BERKELEY FALL 2017-SPRING 2022

Funded on my thesis project "*Effects of Structured Host Genetic Diversity on Infectious Disease Evolution*"

GRADUATE STUDENT INSTRUCTOR, UC BERKELEY FALL 2016-SPRING 2017

Graduate student instructor for IB35AC: Human Biological Variation in Fall 2016 and IB114: Infectious Disease Dynamics in Spring 2017

RESEARCH TECHNICIAN, UNIVERSITY OF MICHIGAN FALL 2014-SPRING 2016

Worked as a research technician in Adam Luring's lab in the Department of Infectious Diseases at University of Michigan on a project studying mutational robustness of Influenza A.

RESEARCH ASSISTANT, YALE UNIVERSITY FALL 2011-FALL 2013

Worked as a research assistant in Brenda Bradley's Primate Molecular Genomics Lab at Yale University on a project studying microsatellite genotyping of chimpanzees from fecal samples.

GRANTS AND AWARDS

EXTERNAL

NSF Postdoctoral Research Award	Spring 2022
Philomathia Graduate Fellowship in the Environmental Sciences (competitive extension)	Spring 2021
Philomathia Graduate Fellowship in Environmental Sciences	Spring 2020
American Society of Naturalists George Gilchrist Student Research Award	Spring 2020
NSF Graduate Research Fellowship, Awardee	Spring 2017
NSF Graduate Research Fellowship, Honorable Mention	Spring 2016

INTERNAL

Stanford Prism-Baker Award	Spring 2022
Summer Research Award, Integrative Biology	Spring 2019
Summer Research Award, Integrative Biology	Spring 2018
GRAC Conference Travel Grant, Integrative Biology	Spring 2018
Graduate Division Conference Travel Grant, UC Berkeley	Spring 2018
Peter and Marion Schwartz Family Foundation Prize for Most Outstanding	Spring 2014
Senior Essay in Biological Anthropology	
Mellon Forum Grant for Research	Fall 2013
Tetelman Fellowship for International Research in the Sciences	Spring 2013
Richter Fellowship for Summer Research	Spring 2013

TEACHING

Reader for IB 114: Infectious Disease Dynamics May 2020

Developed and graded a remote final exam for the course that asked students to relate key concepts from the class to a novel zoonotic epidemic of their choice (including SARS-CoV-2).

Invited Lecture for IB 114: Infectious Disease Dynamics 2017, 2019, 2020

Invited to give a full lecture on my previous research on mutational fitness effects in Influenza A, a short primer on evolutionary and epidemiological concepts in Influenza, and an overview on why genome organization matters when studying infectious disease dynamics. In 2020, the lecture was on my current research on trade-offs in the *Plodia interpunctella* system.

GSI for Field Genomics Short Course Summer 2019

Helped develop and lead a short course for UC Berkeley for rising sophomores that introduced undergraduates to research techniques in genomics from pipetting to sequencing and bioinformatics over ten days. Helped design and lead laboratory experiments and presented lectures on pipetting, dilution series, statistics, and finding research opportunities.

GSI for IB35 AC: Human Biological Variation Fall 2016

Taught sections in lab, lecture, reading discussion, and worksheet formats on topics including vertebrate cranial morphology, mitochondrial DNA ancestry methods, and discussions about bioethics. I also lead a Wikipedia editing project in my section.

GSI for IB 114 : Infectious Disease Dynamics Spring 2017

Taught sections in lecture, question and answer, and discussion formats on topics including virulence evolution, SIR models, and R_0 . Sections were also used to guide students through a final project of a research poster on a specific infectious disease. Also, helped develop the course

and shape the course syllabus including developing project assignments and rubrics. Wrote multiple choice format quiz and exam questions designed to test core concepts of the class through analyzing graphs and applying concepts to scenarios.

CONFERENCE POSTERS AND PRESENTATIONS

2023. Bay Area EEID. SFSU, CA. "The three Ts of virulence evolution during zoonotic emergence". Talk.

2022. Ecology and Evolution of Infectious Disease. Emory, GA. "Ecology can reverse the impact of local adaptation on exploitation rates". Poster.

2022. Genomic, Evolutionary and Epidemiological Approaches for Pandemics Workshop, Newton Institute. Virtual. "The Three Ts of Virulence Evolution During Zoonotic Emergence". Invited Talk.

2022. Bay Area Ecology and Evolution of Infectious Disease. Virtual. "Dynamics of specialism evolution in homogenous host populations". Talk.

2019. Evolution. Providence, RI. "Killing those you know: Host genotype specialization in an insect pathogen". Talk.

2019. Ecology and Evolution of Infectious Disease. Princeton, NJ. "Killing those you know: Host genotype specialization in an insect pathogen". Poster and Teaser Talk.

2019. Bay Area EEID. Stanford, CA. "The evolution of stage-specific virulence: Differential selection of parasites in juveniles". Poster.

2018. Joint Meeting on Infectious Disease Dynamics at The Marine Mammal Center. Sausalito, CA. "When parasites are selected to kill the young". Talk.

2018. Evolution. Montpellier, France. "Evolution of resistance selects for longer development time, but not vice versa". Poster.

UNDERGRADUATE RESEARCH MENTORSHIP

I have mentored students through the following programs: NIH Bridges to Baccalaureate (B2B), Undergraduate Research Apprentice Program (URAP), IB 99/199: Supervised Undergraduate Research, IB 191: Independent Projects, Work-Study, SURF-SMART, EEB Mentor Match, and IB 196: Honors Program Research.

2022-2023 Amir Van Gieson

2021-2022 Jonathan Barajas, Annika McBride, Anisha Ali, Sehar Masud, Edwin Ramos, Cristina Villalobos, Natalie Walzer

2020-2021 Marina Norfolk, Annika McBride, Melissa Chao, Liam Elliott

2019-2020 Marina Norfolk, Annika McBride, Melissa Chao, Diego Gonzalez Ventura, Edith Lai, Aren Yarcana, Dina Alhassani, Nilbert Pascual

2018-2019 Edith Lai, Aren Yarcana, Dina Alhassani, Hannah Mahjoub, Annika Avery, Nicole DeNamur, Nilbert Pascual

2017-2018 Yazmin Haro, Claire Bang, Nilbert Pascual, Tanya Kumar, Khadija Soufi, Vivian Hoang, Zoha Momin, Prempal Athwal, Aleeza Sheikh, Zohal Sarwary

For details about undergraduate projects and current positions see [here](#)

OUTREACH

INSTRUCTOR FOR SMASH ACADEMY

SUMMER 2021

Taught an interactive lesson on “How researchers are responding to Covid-19” focusing on disease ecology and evolution to three sections of high school students over Zoom.

SKYPE A SCIENTIST

SPRING 2019, FALL 2019, SPRING 2020

Skyped with six science classrooms (3rd-12th grades) about adaptation, the scientific method, microbial evolution, and various interesting science anecdotes and facts.

PANELIST FOR INTEGRATIVE BIOLOGY UNDERGRADUATE STUDENTS

MARCH 2017, 2018

Served on a panel about research and graduate school for the UC Berkeley Integrative Biology Undergraduates Students' club

MENTOR FOR BAY AREA GRADUATE PATHWAYS TO STEM

FALL 2017

Mentor for Bay Area Graduate Pathways to STEM, a program that focuses on mentoring undergraduates from California universities who are interested in STEM graduate school and who can contribute to diversifying the graduate student body.

STUDENT TEACHER FOR SPLASH AND SPROUT

SPRING 2012-FALL 2014, FALL 2016

SPLASH is an education outreach program that organizes weekends of single lectures by college students for middle and high school students. SPROUT is an extension of SPLASH that organizes three-part lecture series on a variety of subjects for local middle and high- school students. I have lectured on human and infectious disease evolution for these programs.

WRITER FOR YALE SCIENTIFIC MAGAZINE

MARCH 2012-MAY 2013

I wrote several articles for the Yale Scientific on topics such as autoimmune disease, personal genetics, popular science books, and astronomy.

PROFESSIONAL SERVICE

Graduate Studies Committee Representative

Fall 2020-Spring 2021

Berkeley EEID Seminar Series Coordinator

Summer 2020-Fall 2020

Organizer for Bay Area EEID Conference

Fall 2019-Spring 2020

Developed and Co-Led an Integrative Biology Peer Mentoring Program

Spring 2019- Spring 2021

Interview Weekend Coordinator

Fall 2018-Spring 2020

Integrative Biology Graduate Student Assembly

Fall 2018-Spring 2019

Graduate Representative on Vertebrate Paleontology Faculty Search Committee

Fall 2018

Reviewer for Viruses (1), Nature Ecology & Evolution (1)

PROFESSIONAL TRAINING

Effective Mentoring in Higher Education Class

Spring 2020

Guarda Workshop in Evolutionary Biology

June 2018

Graduate Student Inclusivity Training & Certificate Program.

February 2017

Integrative Biology Teaching Colloquium.

Fall 2016

PROFESSIONAL AFFILIATIONS

Society for the Study of Evolution
American Society of Naturalists