

ELISA VISHER

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EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY

FALL 2016-PRESENT

PhD in Integrative Biology

Advisor: Mike Boots

Thesis: "*Effects of Spatio-Temporally Structured Host Genetic Diversity on Infectious Disease Evolution*" (Proposed)

Qualifying Exam Committee: Britt Koskella, Michael Shapira, Carl Boettiger, and James Holland Jones (Passed December 2017)

Dissertation Committee: Mike Boots, Britt Koskella, Erica Bree Rosenblum

GPA: 4.0/4.0

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., 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.

In review

Visher, E., Bartlett, L., Denamur, N.^u, Yarkan, A.^u, Alhassani, D.^u, & Boots, M. The Evolution of Host Specialization in an Insect Pathogen. (In review)

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

* denotes co-first author

^u denotes undergraduate mentee author

APPOINTMENTS

GRADUATE STUDENT RESEARCHER, BOOTS LAB, UC BERKELEY SPRING 2020-PRESENT

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-PRESENT

Funded on my thesis project "Effects of Spatio-Temporally Structured Host Genetic Diversity on Infectious Disease Evolution"

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

Funded on my thesis project "Effects of Spatio-Temporally 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 Lauring'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

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

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

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". Presentation.

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, and IB 196: Honors Program Research.

2020-2021

Marina Norfolk, Annika McBride, Melissa Chao, Liam Elliott

2019-2020

Marina Norfolk, Annika McBride, Melissa Chao, Diego Gonzalez Ventura, Edith Lai, Aren Yarcen, Dina Alhassani, Nilbert Pascual

2018-2019

Edith Lai, Aren Yarcen, 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-Present
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- Present
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

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