

# AVE T. BISESI

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## EDUCATION

### Ph.D, Ecology, Evolution and Behavior

Aug 2020 - present

University of Minnesota - Twin Cities, St. Paul, MN

- **Advisor:** William R. Harcombe
- **Written preliminary exam (pass with commendations):** Predicting the eco-evolutionary dynamics of multitrophic interactions in moderately complex ecosystems
- **GPA:** 3.88
- Dissertation committee: William R. Harcombe, Elizabeth Borer, Michael Travisano, Steven Bowden
- Graduate Minor in **Data Science**

### M.F.A., Creative Writing, Fiction

July 2018 - Jan 2021

Warren Wilson College, Swannanoa, NC

### B.A., Biology with High Honors

Aug 2013 - May 2017

Oberlin College, Oberlin, OH

- **Advisor:** Angela J. Roles
- **Thesis:** Uncovering Constraints on the Evolution of Genome Architecture: Computational Analysis of Models of Gene Rearrangement in Metazoan Mitochondrial DNA
- **GPA:** 3.8
- Associate membership in **Sigma Xi**, membership in **Phi Beta Kappa**

## PUBLICATIONS

**Bisesi, A.**, Möbius, W., Nadell, C., Hansen, E.G., Bowden, S.D., Harcombe, W.R. (2024). Bacteriophage host range is impacted by interactions between bacteria. *mSystems*. <https://doi.org/10.1128/msystems.01177-23>

Webster, A., Metcalf, A., Kelly, L., **Bisesi, A.**, Marnik-Said, M., Colbeck, C., Marine, R., Vincas, M., Campbell, A., Allen, T. Undergraduates lived experience of project-/problem-based learning in Introductory Biology. *Adv Physiol Educ*. 2022 Jan 6. doi: 10.1152/advan.00042.2021.

Claiborne, D., Dudek, T., Maldini, C., Power, K.A., Ghebremichael, M., Seung, E., Mellors, E.F., Glavin, B., Vrbanc, V.D., Krupp, K., **Bisesi, A.**, Tager, A.M., Knipe, D.M., Boutwell, C., Allen, T.A. (2019). Immunization of BLT Humanized Mice Redirects T Cell Responses to Gag and Reduces Acute HIV-1 Viremia. *Journal of Virology*, JVI.00814-19, doi: 10.1128/JVI.00814-19.

*In review*

Shaw, A., **Bisesi, A.**, Wojan, C., Kim, D., Torstenson, M., Naven Narayanan, Lutz, P., Ales, R., Shao, C. (2024). Six personas to adopt when framing theoretical research questions in biology. *Proceedings of the Royal Society B*.

Connolly, J.A., Del Carratore, F., Schmidt, K., **Bisesi, A.**, Martinson, J.N.V., Chua, J., Kuhs, M., Boneza, M., Heinsch, S., Kinkel, L., Smanski, M., Harcombe, W.R., Breitling, R., Takano, E. (2024). Multi-omics study of a sympatric *Streptomyces* community and the key signalling function of siderophores. *The ISME Journal*.

*In prep*

**Bisesi, A.** and Harcombe, W. R. Metabolic remodeling of microbes by obligate intracellular parasites alters species ratios in microbial communities.

**Bisesi, A., Rosenthal, J., and Roles, A.J.** Testing mechanisms of rearrangement in the mitogenome of crayfish.

## APPOINTMENTS

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### **Graduate Research Assistant**

Jan 2022 - present

*University of Minnesota, Department of Ecology, Evolution and Behavior, St. Paul, MN*

- National Science Foundation grant: “Phage host range evolution in spatially structured microbiomes”
- Co-PIs: William R. Harcombe, Wolfram Moebius, Carey Nadell

### **Inclusive Excellence Fellow**

Aug 2018 - June 2020

*Oberlin College, Howard Hughes Medical Institute, Oberlin, OH*

- Develop and facilitate student programming, workshops, panels, speaker series, journal clubs and discussion spaces for students, staff and faculty
- Develop and present training modules on anti-racism, implicit bias, imposter syndrome, stereotype threat, science communication, science outreach
- Hire, train, manage and mentor a staff of 15-20 undergraduate peer tutors

### **Research Technician**

June 2017 - May 2018

*Ragon Institute of MGH, MIT and Harvard, Allen laboratory, Cambridge, MA*

- Use molecular biology and bioinformatics/genomic techniques to investigate the viral evolution of HIV based on studies of the humanized mouse model

### **Honors Researcher**

Aug 2016 - May 2017

*Oberlin College, Department of Biology, Oberlin, OH*

- Pursue self-directed honors thesis under the supervision of Oberlin Assistant Professor of Biology Angela Roles to use computational methods to evaluate the impact of neutral evolution on mitochondrial gene order rearrangement in crayfish

### **ACCEL Summer Undergraduate Research Fellow**

May 2016 - Aug 2016

*Nemours/A.I DuPont Hospital for Children, Wilmington, DE*

- Design, conduct and complete research on preclinical testing of targeted therapies in combination with eribulin in osteosarcoma under the direction and supervision of Dr. Valerie Sampson, PhD, Dr. EA Kolb, MD, and Nancy Vetter, BS

## GRANTS AND AWARDS

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- **Elmer C. Birney Fellowship**, University of Minnesota 2024
- **BTI Travel Award**, University of Minnesota 2024
- **EEB Travel Award**, University of Minnesota 2024
- **EEB Summer Fellowship**, University of Minnesota 2023
- **EEB Travel Award**, University of Minnesota 2022
- **AMS Summer Policy Colloquium Travel and Attendance Grant**, National Science Foundation 2021
- **Chancellor’s Fellowship for Graduate Study (declined)**, University of California-Berkeley 2020 - 2022
- **EEB Excellence Fellowship for Graduate Study**, University of Minnesota 2020 - 2021
- **Institute for Cellular and Molecular Biology Graduate Fellowship (declined)**, University of Austin-Texas 2020 - 2021
- **Carol Houck Smith Scholarship**, Warren Wilson College MFA Program for Writers 2020
- **Scientific Teaching Fellow**, HHMI, NSF and Yale Center for Teaching and Learning 2019 - 2020

- **Rodney Jack Scholarship**, Warren Wilson College MFA Program for Writers 2019 - 2020
- **HHMI Post-Graduate STEM Fellowship**, Oberlin College 2018 - 2020
- **Norman H. Wright Prize in Biology**, Oberlin College 2017
- **ACCEL Undergraduate Research Fellowship**, Nemours Undergraduate Research Program 2016
- **John F. Oberlin Scholarship**, Oberlin College 2013 - 2017

## PRESENTATIONS, POSTERS AND EXHIBITS

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### *Invited Talks*

**Ave Bisesi.** Consequences of phage-induced metabolic reprogramming in multispecies bacterial communities. Talk presented at: UMN Virology Symposium 2023.

**Ave Bisesi.** Bacteriophage specialization is impacted by interactions between bacteria. Talk presented at: UMN Virology Symposium 2022.

**Ave Bisesi.** Backward design and metacognition for optimizing inclusive teaching. Workshop presented at: Oberlin Workshop and Learning Sessions Fall 2019 Training; September, 2019; Oberlin College, Oberlin, OH.

**Ave Bisesi.** Facilitation skills: tools for student leaders. Workshop presented at: Center for Student Success First Generation Peer Mentor Training Weekend; August, 2019; Oberlin College, Oberlin, OH.

**Ave Bisesi.** Burn-out and boundaries: self-care for inclusive pedagogy. Workshop presented at: Oberlin Workshop and Learning Sessions Spring 2019 Training; February, 2019; Oberlin College, Oberlin, OH.

**Ave Bisesi.** Tackling implicit bias in the classroom: Tools for Faculty. Workshop presented at: Oberlin HHMI Departmental Action and Reflection Team Data Workshop; January 25, 2019; Oberlin College, Oberlin, OH.

### *Contributed Talks*

**Ave Bisesi.** Metabolic remodeling of microbes by obligate intracellular parasites alters species ratios in microbial communities. Talk presented at: ASM Conference 2024.

**Ave Bisesi.** Metabolic remodeling of microbes by obligate intracellular parasites alters species ratios in microbial communities. Talk presented at: UMN Biofilms Symposium 2024.

**Ave Bisesi.** Host interactions shape the evolution of specialization in bacteriophage. Talk presented at: Evolution Meetings 2021.

**Ave Bisesi** and Nicollette Mitchell. CLEARing the Way: Establishing an inclusive peer mentorship program. Talk presented at: 2019 Project Kaleidoscope Upstate NY Regional Networking Meeting; April, 2019; Rochester Institute of Technology, Rochester, NY.

**Ave Bisesi.** Uncovering constraints on the evolution of genome architecture: a computational analysis of models of gene rearrangement in metazoan mitochondrial DNA. Talk presented at: Oberlin College Undergraduate Research Symposium 2017.

**Ave Bisesi.** Preclinical testing of targeted therapies in combination with eribulin in osteosarcoma . Talk presented at: Nemours Summer Undergraduate Research Symposium 2016.

### *Posters*

**Ave Bisesi.** Bacteriophage host range is impacted by interactions between bacteria. Poster presented at: Ecology and Evolution of Infectious Diseases 2024.

**Ave Bisesi.** Metabolic remodeling of microbes by obligate intracellular parasites alters species ratios in microbial communities. Poster presented at: International Conference of Microbiome Engineering 2023.

**Ave Bisesi.** Bacteriophage host range is impacted by interactions between bacteria. Poster presented at: Microbial Population Biology Gordon Research Conference 2023.

**Ave Bisesi.** Bacteriophage host range is impacted by interactions between bacteria. Poster presented at: ASM Conference 2023.

**Ave Bisesi.** Bacteriophage specialization is impacted by interactions between bacteria. Poster presented at: ASM Conference 2022.

**Ave Bisesi.** Uncovering Constraints on the Evolution of Genome Architecture: A Computational Analysis of Models of Gene Rearrangement in Metazoan Mitochondrial DNA. Poster presented at: Evolution Meetings 2017; June 25, 2017; Portland, OR.

## TEACHING AND MENTORING

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### **Data Carpentries Instructor**

Sept 2022 - present

*University of Minnesota, Department of Ecology, Evolution and Behavior, St. Paul, MN*

- Certified instructor for Data Carpentries Core Curriculum, including: Data Carpentry, Library Carpentry, and Software Carpentry
- Co-instructor for  $\text{\LaTeX}$ , Unix shell scripting, R for Reproducible Data Science, and Python workshops hosted at the UMN

### **Undergraduate Research Mentor**

Aug 2020 - present

*University of Minnesota, Department of Ecology, Evolution and Behavior, St. Paul, MN*

- Provide lab training and supervision, oversee individual and collaborative undergraduate projects
- 2020-2021: Carissa Metzger
- 2021-2022: Carissa Metzger, Carmen Crutchfield
- 2023-2024: Echo Ireland
- 2024: Lachlan Cotner

### **Graduate Teaching Assistant**

Fall 2021 and Fall 2023

*University of Minnesota, Department of Ecology, Evolution and Behavior, St. Paul, MN*

- Course: BIOL 3409/5409 Evolution
- Instructor and grader for two laboratory sections

### **Field Guides Mentor**

Aug 2020 - May 2023

*University of Minnesota, Department of Ecology, Evolution and Behavior, St. Paul, MN*

- Meet bi-weekly to provide a one-on-one resource for information regarding graduate school and science careers
- 2020-2021: Kayla Siemann
- 2021-2022: Kayla Siemann, Sydney Gunter
- 2022-2023: Aubrey Wendorff, Emily Hughes

### **Teaching Assistant and Peer Tutor**

January 2015 - May 2017

*Oberlin College, Department of Biology, Oberlin, OH*

- Teaching assistant and peer tutor; responsible for preparing lab equipment, demoing experiments, refining curriculum and lectures, and tutoring and providing academic support to students

### **Quantitative Skills Peer Tutor and Workshop Instructor**

January 2015 - May 2016

*Oberlin College, Department of Biology, Oberlin, OH*

- Quantitative skills tutor and workshop instructor; responsible for tutoring and providing academic support to students and working with the instructor of record to design supplemental lesson plans,

lectures, workshops and assignments

## OUTREACH AND ADVOCACY

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### **Queer Science**

April 2022 - present

*University of Minnesota - Twin Cities, Minneapolis, MN*

- Workshop facilitator and volunteer for twice-yearly events showcasing scientific research at the university level for local LGBTQ high school students

### **CBS UROP Proposal Review**

November 2023

*University of Minnesota - Twin Cities, Minneapolis, MN*

- Application reviewer for the College of Biological Sciences' undergraduate research opportunity program

### **BTI Community Outreach, Retention and Engagement Program**

March 2023

*University of Minnesota - Twin Cities, Minneapolis, MN*

- Volunteer for events showcasing scientific research at the university level for high school students and families

### **Institute on the Environment Graduate Scholar**

Aug 2021 - May 2022

*University of Minnesota - Twin Cities, St. Paul, MN*

- Member of interdisciplinary cohort program focused on sharing academic work, engaging with diverse stakeholders, and developing resources on ecosystem health

### **AMS Summer Policy Colloquium Fellow**

June 2021

*American Meteorological Society, Washington, D.C.*

- NSF Fellow and participant in workshops, colloquia and meetings with federal officials and Congressional staffers covering current science policy issues

### ***The Synapse***

Aug 2016 - June 2020

*Oberlin College, Oberlin, OH*

- Writer and contributor to Oberlin College's science communication magazine of record
- Articles include:
  - December 2018. Scientific Colonialism and Biopiracy: Moving Beyond Patents and Intellectual Property.
  - September 2017. The Nature of Knowledge: Decolonizing Scientific Expertise and Discourse.
  - May 2017. Making a Case for Citizen Science: Innovation in Science Education and Accessibility.

## PROFESSIONAL SERVICE

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### **Field Guides Planning Committee**

August 2022 - present

*University of Minnesota, St Paul, Minnesota*

- Member of the planning committee for the Field Guides program, responsible for coordinating mentorship pairs, planning and leading mentoring workshops, and planning and hosting informational events for undergraduates

### **EEB Ethics Committee**

August 2020 - August 2023

*University of Minnesota, St Paul, Minnesota*

- Member of the graduate student ethics committee, responsible for planning and leading two seminars per semester on topics in research ethics

**Welcome Week Graduate Student Panelist**

January 2022

*University of Minnesota, St Paul, Minnesota*

- Participant in a panel discussion about graduate school and research for prospective EEB graduate students

**EEB Diversity Committee**

August 2020 - August 2021

*University of Minnesota, St Paul, Minnesota*

- Member of the graduate student diversity committee

**PROFESSIONAL AFFILIATIONS**

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- American Meteorological Society
- Society for the Study of Evolution
- Ecological Society of America
- American Society for Microbiology
- National Science Policy Network