

Alaina Rose Weinheimer

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EDUCATION

- Ph.D. in Biological Sciences** August 2018 – present
Virginia Polytechnic Institute and State University
Blacksburg, VA
Institute for Critical Technology and Applied Science Doctoral Scholar
Interfaces of Global Change Fellow
Advisor: Dr. Frank Aylward
- M.Sc. in Marine Microbiology** October 2016 – March 2018
Max Planck Institute for Marine Microbiology/University of Bremen
Bremen, Germany
Advisors: Dr. Nicole Dubilier and Dr. Matthew Sullivan
- B.S. in Biology – ecology concentration** August 2012 – May 2016
Schreyer Honors College, Pennsylvania State University
University Park, PA
Minors: Microbiology, Marine Science

GRANTS / AWARDS / HONORS

- Robert Patterson Scholarship**, Dept. Biological Sciences, Virginia Tech **\$800** June 2021
- First Place, 2021 Karen P. DePauw Outstanding Interdisciplinary Presentation Award**,
Interfaces of Global Change Graduate Research Symposium **\$200** April 2021
- Young Ambassador to Virginia**, American Society for Microbiology January – December 2021
- Doctoral Scholar**, Institute for Critical Technology & Applied Science, **\$33,000/yr** August 2018-present

PUBLICATIONS

Weinheimer, AR, Aylward, FO, (2022). Infection strategy and biogeography distinguish cosmopolitan groups of marine jumbo bacteriophages. *The ISME Journal*. (In press).

Moniruzzaman, M, **Weinheimer, AR**, Martinez-Gutierrez, CA, & Aylward, FO (2020). Widespread endogenization of giant viruses shapes genomes of green algae. *Nature*, 588(7836), 141-145.

Lakoba, V, Wind, L, DeVilbiss, S, Lofton, M, Bretz, K, **Weinheimer, A**, Moore C, Baciocco C, Hotchkiss E, & Hession, WC (2020). Salt Dilution and Flushing Dynamics of an Impaired Agricultural–Urban Stream. *ACS ES&T Water*, 1(2), 407-416.

Weinheimer, AR, & Aylward, FO. (2020). A distinct lineage of *Caudovirales* that encodes a deeply branching multi-subunit RNA polymerase. *Nature communications*, 11(1), 1-9.

Moniruzzaman, M, Martinez-Gutierrez, CA, **Weinheimer, AR**, & Aylward, FO. (2020). Dynamic genome evolution and complex virocell metabolism of globally-distributed giant viruses. *Nature communications*, 11(1), 1-11.

Cordes, EE, Auscavitch, S, Baums, IB, Fisher, CR, Girard, F, Gomez, C, McClain-Counts J, Mendlovitz HP, & **Weinheimer, A.** (2016). ECOGIG: Oil spill effects on deep-sea corals through the lenses of natural hydrocarbon seeps and long time series. *Oceanography*, 29(1), 28-29.

SELECT POSTERS/PRESENTATIONS

Weinheimer AR, Scott, J, Leray, M, Aylward FO., *Variation in phage diversity reflects parallel, yet divergent ecosystems along Panama's coasts*. Biological Sciences Research Day. (virtual) Virginia Tech, Blacksburg, VA, USA. February 5, 2022. (oral presentation)

Weinheimer A. R, Aylward FO., *Hidden jumbo phages make waves in the global ocean*. Aquatic Virus Workshop 10. (virtual) Hosted by Kyoto University, Kyoto, Japan. June 27 – July 1, 2021. (pre-recorded oral presentation)

Weinheimer A. R., Aylward F. O., *Hidden jumbo phages make waves in the global ocean*. World Microbe Forum. Virtual hosted by the American Society for Microbiology and the Federation of European Microbiological Societies. June 20 -24, 2021. (ePoster)

Weinheimer A. R., Aylward F. O., *Too big to see: large viruses are overlooked players in the ocean's nutrient cycles*. Interfaces of Global Change Graduate Research Symposium. (virtual) Virginia Tech, Blacksburg, VA, USA. April 23, 2021. (oral presentation) – First Place Presentation

Weinheimer A. R., Aylward F. O., *Ancient origin and acquisition of multi-subunit RNA polymerase by bacteriophages revealed by an RNA polymerase Tree of Life*. International Society of Microbial Ecology Virtual Summit #UnityInDiversity, November 11-12, 2020. (ePoster)

Weinheimer A. R., Aylward F. O., *Ancient Origin and Deep Phylogenetic Placement of Bacteriophage in the Tree of Life*. American Society of Microbiology Microbe Online, 2020. (ePoster)

Weinheimer, A., Navarro-Muñoz, J., Glöckner, F. O., Medema, M., Fernandez-Guerra, F., *Defining gene cluster families from globally-distributed seawater samples using community detection methods*. YOUMARES 8 Conference, Kiel University, Kiel, Schleswig-Holstein, Germany. September 15, 2017. (Presentation)

RESEARCH EXPERIENCE

Graduate Research Assistant, Dr. Frank O. Aylward Lab August 2018 – present

Dept. of Biological Sciences, Virginia Tech, Blacksburg, VA

- Examining the ecology and evolution of jumbo phage using publicly available metagenomic data and reference genomes

Master's Thesis Research, Dr. Nicole Dubilier Lab and September 2017 – August 2018

Dr. Matthew B. Sullivan Lab

Dept. of Symbiosis, Max Planck Institute of Marine Microbiology
Bremen, Bremen, Germany

Dept of Microbiology, Ohio State University, Columbus, Ohio, USA

- Explored the virome associated with the symbiosis between deep sea *Bathymodiolus* mussels and their chemosynthetic microbial partners, using metagenomic data

Research Assistant, Dr. Mónica Medina Lab

August 2015 – April 2017

Pennsylvania State University, University Park, PA

- Analyzed microbial diversity and dynamics associated with strains of *Symbiodinium*
- Assessed the impact of salinity on the composition of the coral microbiome as part of the Global Coral Microbiome Project

Research Assistant, Dr. Iliana Baums Lab

August 2013 – May 2016

Pennsylvania State University, University Park, PA

- Genotyped *Orbicella faveolata* larvae and *Acropora cervicornis* larvae and parent individuals, eggs, for separate compatibility
- Extracted DNA from *Acropora palmata* samples
- Extracted RNA from *Acropora cervicornis* samples
- Thesis research

Summer Intern, Dr. Joshua Voss Lab

May 2015 – July 2015

Harbor Branch Oceanographic Institute, Fort Pierce, FL

- Compared the microbiomes of *Montastraea cavernosa* colonies along the St. Lucie Inlet freshwater discharge gradient
- Photographed images along transect lines in Geyer Bank, McGrail Bank, and Bright Bank; *Montastraea cavernosa* sample processing; species identification for annotation aboard the R/V Manta

Research Assistant, Dr. Amanda Demopoulos Lab

April 2015 – May 2015

U.S. Geological Society, Gainesville, FL

- processed deep sea sediment from push cores for macrofaunal and meiofaunal analyses aboard the first leg of the E/V Nautilus 057 cruise in the Gulf of Mexico

NSF REU Marine Microbiology Intern, Dr. Kim Ritchie Lab

May 2014 – August 2014

Mote Marine Laboratory, Sarasota, FL

- Analyzed the effects of ocean acidification on calcification rates, microbial communities, respiration and photosynthetic rates, of six different genotypes of *Acropora cervicornis*, staghorn coral

TEACHING EXPERIENCE

Teaching Assistant – Spring 2021

Course: Systems Biology of Genes and Proteins (SYSB 3036), Virginia Tech, VA, USA

Held weekly recitation, graded assignments and quizzes, and presented lecture on viral diversity

Learning Assistant – Spring 2016

Course: Principles of Virology (MICRB 4015), Pennsylvania State University, PA, USA

Held exam review sessions, assist exam development

MENTORING EXPERIENCE

Undergraduate, Riley Wilson (January 2021 – present); providing guidance on coding and analyses for senior project required by the Systems Biology program; comparing bacteriophage genomes based on shared genes

Undergraduate, Meagen Todd (now graduate student at Wake Forest University), 2019 – 2020
taught network analyses and genome annotation to study prophage of *Clostridium*

Undergraduate, Ashleen Harris (now graduate student at Radford University), Spring 2020
guided project on identifying toxin homology to non-toxin proteins, taught how to perform
sequence searches (BLASTp) and structural searches (DALI) in batch

Undergraduate HHMI Millennial Scholar, Fabiola Maldonado, 2016
taught DNA isolation, algal culturing, cell counting, bacterial culturing, and microscopy for a
project I led on the microbiome of *Symbiodinium*

FIELD EXPERIENCE

Varadero Reef Field Expedition, Cartagena Bay, Colombia (2018)

E/V Nautilus Cruise 057, Gulf of Mexico (2015)

R/V Manta Cruise, Flower Garden Banks, Gulf of Mexico (2015)

Global Coral Microbiome Project Field Expedition, Cartagena Bay, Colombia (2015)

LEADERSHIP AND SERVICE

President, VT Biology Graduate Student Association 2021 – present
Vice President – 2020-2021

Vice President, Interfaces of Global Change Grad Student Organization 2021 – present
Social Chair – 2019 - 2021

ASM Young Ambassador to Virginia 2021 – present
- Co-organized Lounge & Learn Session at the World Microbe Forum. Opening Academic
Borders: Graduate and Postdoctoral Opportunities in the USA and Abroad. June 23, 2021
- Co-organizer, moderator, and video editor for the ASM Early Career Flashtalk Series. October
21, 2021

Biological Sciences Department Representative to the VT Graduate Student Association 2019 – 2020

OUTREACH AND SCIENCE COMMUNICATION

Co-editor of Food Water and Communities website on ArcGIS StoryMaps. Funded by the Center for
Communicating Science at Virginia Tech. Paid position. [Website](#)

Weinheimer, Alaina. "Impossible Coral Reef in Varadero Cartagena, Colombia – 2018". *Food Waters &
Communities*. Article. May 21, 2021.

<https://storymaps.arcgis.com/stories/c89693a368314fedb9ddbda7549568b2>

"Are viruses dead or alive?", Virginia Tech Science Festival Annual Exhibit 2020
Virtual presentation to a 7th grade class, described how viruses infect cells and answered
questions about viruses and immunology

Weinheimer, Alaina. "A Mystery Clade in the Tree of Life". *Nature Ecology and Evolution: Behind the
Paper*. Blog Post. September 9, 2020.

<https://naturecoevocommunity.nature.com/posts/a-mystery-clade-in-the-tree-of-life>

"The DNA of You and Me" Kindergarten Visit as part of Virginia Tech's Center for 2020
Communicating Science Girls Launch Program, developed activity and presentation, taught the
terms of DNA, genes, and genomes with colored stickers

Community science events

Science Olympiad Grader (2020), Virginia Tech Science Festival exhibitor with the Interfaces of
Global Change Graduate Student Organization, Gilbert Linkus Elementary School science fair
judge (2019), Virginia State Science Fair judge (2019), Science Olympiad Grader (2020),
STEMposium at Eastern Elementary exhibitor volunteer (2019)
