

# GEOFF ZAHN, PHD

Associate Professor of Biology | Assoc. Dept. Chair - UVU Biology

**Translational microbial ecology | Microbiomes and symbiosis**



## PROFESSIONAL APPOINTMENTS

Current   2023	<b>Associate Professor &amp; Assoc. Dept. Chair</b> Utah Valley University	📍 Orem, UT
2023   2017	<b>Assistant Professor</b> Utah Valley University	📍 Orem, UT
Current   2020	<b>Private Consulting</b> Forensic Bioinformatics / Data Science + App development	📍 Various
2021   2018	<b>Director of Environmental Biology</b> GeoDataCrawler Research Institute	📍 Athens, GA
2017   2015	<b>Postdoctoral Associate</b> University of Hawai`i at Manoa	📍 Honolulu, HI

## EDUCATION

2015	<b>University of Arkansas</b> Ph.D. in Biology	📍 Fayetteville, AR
2010	<b>Missouri State University</b> B.S. in Ecology, Evolution, and Systematics	📍 Springfield, MO

## SELECTED FUNDING AND AWARDS

**Total funding: \$1,193,494**

### *Pending funding*

**Collaborative Research: Burning questions in microbial ecology: Ecological mechanisms that control microbiome transplant outcomes** Co-PI | NSF DEB

**S-STEM: Faculty-Mentored Experiences for Improving Undergraduate Biology Student Outcomes** PI | NSF DUE (submitted for 6-year extension)

## CONTACT INFO

✉ [gzahn@uvu.edu](mailto:gzahn@uvu.edu)  
🌐 [github.com/gzahn](https://github.com/gzahn)  
🏠 <https://gzahn.github.io>

## SKILLS

### 💻 Computational:

R  
Bash  
SQL  
Python  
Unix admin  
High-performance computing  
Metagenomics /  
Metabarcoding

### 🧪 Wet-lab:

DNA (extraction/prep/seq/etc.)  
Culturing (Fungi and 'Protists')  
Microscopy  
(BF/DIC/Fluor/SEM)  
Soil analysis  
Microcosms

### 📖 Academic:

Course and program design  
Active learning  
Course-based undergraduate research  
Mentoring  
Lab management  
Grants management

2023   2018	<b>PI: Faculty-Mentored Experiences for Improving Undergraduate Biology Student Outcomes</b> \$972,287 <div>📍 NSF (DUE – 1833880)</div>
2020, 2022	<b>College of Science Dean's Award of Excellence for Scholarship</b> \$5,500 <div>📍 UVU</div>
2019	<b>Presidential Fellowship for Faculty Scholarship</b> \$8,000 <div>📍 UVU</div>
2018   2017	<b>PI: SEED: Engaging undergraduates in advanced research</b> \$30,000 <div>📍 UVU</div>
2018	<b>PI: New methods to survey fungal endophytes in endangered cacti</b> \$2,550 <div>📍 Capitol Reef National Park</div>
2018	<b>Co-PI: Assessing Undergraduate Research Teams at an Open Enrollment Institution</b> \$29,327 <div>📍 UVU</div>
2016	<b>Translational Mycology Postdoctoral Award</b> Plant conservation from a microbial perspective <div>📍 Mycological Society of America</div>
2015	<b>Co-PI: Restoration of endangered plants by manipulating foliar fungal symbionts</b> \$40,500 <div>📍 Oahu Army Natural Resources Program</div>
2014	<b>Japan Society for the Promotion of Science Travel Award</b> \$750 <div>📍 Washington, D.C.</div>
2013	<b>PI: The Importance of microbial interactions to soil carbon cycling on a warming planet</b> \$22,570 <div>📍 NSF (OISE-1308856) / JSPS (SP01363)</div>
Current   2017	<b>Student Mentee Funding Awards</b> 138 undergrad mentees funded from a variety of internal and external programs



## TEACHING AND MENTORING

- Designed a new Bioinformatics Degree Program**  
 Experienced with univ. curriculum processes and accreditation
- R for Biologists**  
 Intro to R language and data science, including dataviz & modeling (designed and taught)

### Bioinformatics Data Skills

Unix/Bash and HPC use for bioinformatics (designed and taught)

### Mycology

Research-based mycology (designed and taught)

### Microbiome Boot Camp

Advanced R, numerical ecology, community ecology, scientific writing (designed and taught)

### Bioinformatics Capstone

Project-based (designed and taught)

### Organismal Biology

Intro biology II (taught)

### Developed online lab for non-major's biology

University of Arkansas - asynchronous pedagogy practices



## PUBLICATIONS

2023

### Wallace's line is a barrier to the dispersal of seagrass-associated marine bacteria

Wainwright B, Leon J, Hickman KJE, Vilela E, Caldwell J, Aimone B, Bischoff P, Ohran M, Morelli M, Arlyza I, Marwayana O, & **Zahn G. *In Review***

2023

### The core mangrove microbiome reveals shared taxa potentially involved in nutrient cycling and promoting host survival.

Wainwright BJ, Millar T, Bowen L, Semon L, Hickman KJE, Lee JN, Yeo ZY, & **Zahn G. *Environmental Microbiome* 10.1186/s40793-023-00499-5.**

2023

### Inclusion of database outgroups reduces false positives in fungal metabarcoding taxonomic assignments.

Rawson C, & **Zahn G. *Mycologia* 10.1080/00275514.2023.2206931**

2022

### Long-term soil fungal community recovery after fire is impacted by climate change.

McGee S, Tidwell A, Riggs E, Veltkamp H, & **Zahn G. *Western North American Naturalist***

2022

### Marker Genes (16S and ITS) Protocol for Plant Microbiome Analyses.

**Zahn G. *BIO-PROTOCOL* 10.21769/BioProtoc.4395**

- 2022 ● **Global patterns in endemism and vulnerability of soil fungi.**  
Tedersoo L, Mikryukov V, Zizka A, Bahram M, Hagh-Doust N, Anslan S, Prylutskyi O, Delgado-Baquerizo M, Maestre FT, **Zahn G**, ... Abarenkov K. *Global Change Biology* 10.1111/gcb.16398
- 2021 ● **The Global Soil Mycobiome consortium dataset for boosting fungal diversity research.**  
Tedersoo L, Mikryukov V, Anslan S, Bahram M, Khalid AN, Corrales A, Agan A, Vasco-Palacios A-M, Saitta A, **Zahn G**, ... Abarenkov K. *Fungal Diversity* 10.1007/s13225-021-00493-7
- 2021 ● **Examination of host-taxon, environment, and distance effects on leaf fungal endophytes in the dominant woody genus, *Metrosideros*, on O'ahu.**  
Sur GL, **Zahn G**, & Stacy EA. *Fungal Ecology* 10.1016/j.funeco.2021.101093
- 2021 ● **Biogeographic structure of fungal communities in seagrass *Halophila ovalis* across the Malay Peninsula.**  
Quek ZBR, **Zahn G**, Lee NLY, Ooi JLS, Lee JN, Huang D, & Wainwright BJ. *Environmental Microbiology Reports* 10.1111/1758-2229.13003
- 2021 ● **Restoration of the mycobiome of the endangered Hawaiian mint *Phyllostegia kaalaensis* increases its resistance to a common powdery mildew.**  
Egan CP, Koko JH, Muir CD, **Zahn G**, Swift SOI, Amend AS, & Hynson NA. *Fungal Ecology* 10.1016/j.funeco.2021.101070
- 2021 ● **Hawaiian Fungal Amplicon Sequence Variants Reveal Otherwise Hidden Biogeography.**  
Tipton L, **Zahn G**, Darcy JL, Amend AS, & Hynson NA. *Microbial Ecology* 10.1007/s00248-021-01730-x
- 2021 ● **Essential oil, insect, and microbe relationships in *Juniperus osteosperma* (Cupressaceae) trees killed by wildfire.**  
Wilson T, Poulson A, Packer C, Carlson R, Davis R, Dey M, Owen N, Smalley S, Dodge R, **Zahn G** ... Stevens M. *Phytologia*
- 2020 ● **Host age is not a consistent predictor of microbial diversity in the coral *Porites lutea*.**  
Wainwright BJ, **Zahn GL**, Afiq-Rosli L, Tanzil JTI, & Huang D. *Scientific Reports* 10.1038/s41598-020-71117-4
- 2020 ● **Fungal communities living within leaves of native Hawaiian dicots are structured by landscape-scale variables as well as by host plants.**  
Darcy JL, Swift SOI, Cobian GM, **Zahn GL**, Perry BA, & Amend AS. *Molecular Ecology* 10.1111/mec.15544

- 2019 ● **Fungal aerobiota are not affected by time nor environment over a 13-y time series at the Mauna Loa Observatory.**  
Zahn G, Tipton L, Datlof E, Kivlin SN, Sheridan P, Amend AS, & Hynson NA. *Proceedings of the National Academy of Sciences* 10.1073/pnas.1907414116
- 2019 ● **Foliar fungi alter reproductive timing and allocation in Arabidopsis under normal and water-stressed conditions.**  
Zahn G, & Amend AS. *Fungal Ecology* 10.1016/j.funeco.2019.04.002
- 2019 ● **Characterization of fungal biodiversity and communities associated with the reef macroalga *Sargassum ilicifolium* reveals fungal community differentiation according to geographic locality and algal structure.**  
Wainwright BJ, Bauman AG, Zahn GL, Todd PA, & Huang D. *Marine Biodiversity* 10.1007/s12526-019-00992-6
- 2019 ● **Characterisation of coral-associated bacterial communities in an urbanised marine environment shows strong divergence over small geographic scales.**  
Wainwright BJ, Afiq-Rosli L, Zahn GL, & Huang D. *Coral Reefs* 10.1007/s00338-019-01837-1
- 2019 ● **Seagrass-associated fungal communities show distance decay of similarity that has implications for seagrass management and restoration.**  
Wainwright BJ, Zahn GL, Zushi J, Lee NLY, Ooi JLS, Lee JN, & Huang D. *Ecology and Evolution* 10.1002/ece3.5631
- 2018 ● **Seagrass-associated fungal communities follow Wallace's line, but host genotype does not structure fungal community.**  
Wainwright BJ, Zahn GL, Arlyza IS, & Amend AS. *Journal of Biogeography* 10.1111/jbi.13168
- 2017 ● **Foliar microbiome transplants confer disease resistance in a critically-endangered plant.**  
Zahn G, & Amend AS. *PeerJ* 10.7717/peerj.4020
- 2017 ● **Uncovering unseen fungal diversity from plant DNA banks.**  
Datlof EM, Amend AS, Earl K, Hayward J, Morden CW, Wade R, Zahn G, & Hynson NA. *PeerJ* 10.7717/peerj.3730
- 2017 ● **Fungi associated with mesophotic macroalgae from the 'Au'au Channel, west Maui are differentiated by host and overlap terrestrial communities.**  
Wainwright BJ, Zahn GL, Spalding HL, Sherwood AR, Smith CM, & Amend AS. *PeerJ* 10.7717/peerj.3532

- 2016 ● **The effects of amoebal bacterivory on carbon and nitrogen dynamics depend on temperature and soil structure interactions.**  
Zahn G, Wagai R, & Yonemura S. *Soil Biology and Biochemistry*
- 2014 ● **Ecological distribution of protosteloid amoebae in New Zealand.**  
Zahn G, Stephenson SL, & Spiegel FW. *PeerJ*
- 2014 ● **First records of Protosteloid Amoebae (Eumycetozoa) from the Democratic Republic of the Congo.**  
De Haan M, Cocquyt C, Tice A, Zahn G, & Spiegel FW. *Plant Ecology and Evolution*
- 2011 ● **Pil1, an eisosome organizer, plays an important role in the recruitment of synaptojanins and amphiphysins to facilitate receptor-mediated endocytosis in yeast.**  
Murphy ER, Boxberger J, Colvin R, Lee SJ, Zahn G, Loor F, & Kim K. *European Journal of Cell Biology*



## SELECTED INVITED PRESENTATIONS


- 2023 ● **Translating mentored undergraduate research into student retention and success**  
National Science Foundation S-STEM Symposium 📍 Washington, D.C.
- 2022 ● **Less content, more context: Research as pedagogy in undergraduate mycology courses**  
Mycological Society of America 📍 FL, USA
- 2021 ● **Who's there and who cares: the how and why of fungal community structure**  
Brigham Young University 📍 UT, USA
- 2018 ● **The causes and consequences of fungal community structure**  
University of Arkansas/Missouri State University 📍 AR/MO, USA
- 2016 ● **Picky Eaters: Prey choice by soil protists is altered by temperature and soil structure**  
Cornell University, 📍 NY, USA
- 2015 ● **Effects of belowground trophic complexity on carbon cycling under changing climatic and edaphic conditions**  
Joint Genome Institute 📍 CA, USA
- 2015 ● **The functional and distributional ecology of mycetozoans under changing edaphic and climatic dynamics**  
Climate Impact Research Center 📍 Abisko, Sweden

2014 ● **Picky eaters: climate alters amoeba prey choice and the microbial loop**  
NIAES  Tsukuba, Japan


2012 ● **The Tropical Mycetozoans**  
Organization for Tropical Studies  Las Cruces, Costa Rica

## SELECTED CONTRIBUTED PRESENTATIONS


2023 ● **Aquatic Plant-Associated Fungi Along an Urbanization Gradient**  
Mycological Society of America  AZ, USA

2023 ● **Metagenomic Tools for Mycobiome Analyses in Model vs. Non-Model Systems**  
Mycological Society of America  AZ, USA


2023 ● **Improving the Accuracy of Meta-Amplicon Taxonomic Assignments Through the Inclusion of Outgroups in Fungal Databases**  
Mycological Society of America  AZ, USA

2022 ● **Inspecting the microbiome and metabolomic compartments of Mediterranean sponge holobionts through an integrated 'omics approach**  
International Sponge Symposium  Leiden, Netherlands

2016 ● **Fungal endophytes and pathogens in endangered hawaiian endemics: Plant conservation from a microbial perspective**  
Mycological Society of America,  CA, USA

2014 ● **The interactive effects of protozoan predation pressure and environmental factors on carbon and nitrogen cycling in soils under warming conditions**  
International Society for Microbial Ecology  Seoul, South Korea

2014 ● **Using metagenomics and metatranscriptomics to uncover mechanisms of soil communities' effects on carbon cycling under warming conditions**  
DOE Joint Genome Institute  CA, USA

2013 ● **The Role of Soil Amoebae in Nutrient Cycling on a Warming Planet**  
Graduate University for Advanced Studies  Soken dai, Japan

2011 ● **The Protosteloid Amoebae of New Zealand**  
Mycological Society of America  AK, USA

## </> CODE CONTRIBUTIONS

- **Microbiome protocol for ITS/16S exploration**  
[https://github.com/gzahn/Microbiome\\_Workshop](https://github.com/gzahn/Microbiome_Workshop)
- **R for exploratory data analysis course**  
<https://gzahn.github.io/data-course/>
- **Collection of custom bioinformatics tools**  
<https://github.com/gzahn/tools>
- **Tool for creating QIIME-compatible taxonomic databases from any subset of NCBI data.**  
<https://doi.org/10.5281/zenodo.3688556>
- **Bioinformatics Data Skills course**  
<https://gzahn.github.io/binf-data-skills/>



## SYNERGISTIC ACTIVITIES

- **Mentorship**
  - Graduate committee member (4 MS, 3 PhD)
  - Undergrad research mentor (38 students)
  - [Lab alumni](#)
  - Junior faculty mentor (2023)
- **Societies & Service**
  - Editor of *Mycologia*
  - Education Committee - Mycological Society of America
  - IUCN Species Survival Group - Slime Moulds Specialist
  - Member: ISME, MSA, Intl. Soc. for Fungal Conserv., Japan SPS Alumni Assoc.
  - NSF GK-12 Teaching Fellow (2011-2012)
  - Faculty senator - UVU (2017-2020)
  - Program and course development (Univ. of Arkansas, Utah Valley Univ.)
  - Faculty search committees (Chair 1x, Member 6x)
  - Council for Undergraduate Research (member)



## Collaborations (current and past)

- National Univ. of Singapore
- Universiti Malaysia Terengganu
- Universiti Malaya, Kuala Lumpur
- Univ. of Hawaii at Manoa
- Oxford Univ.
- Univ. of Arkansas
- Univ. of Nevada, Las Vegas
- Okanagan College
- University of Colorado, Anschutz
- Stazione Anton Dorhn
- Washington State Univ.
- SUNY Syracuse
- Univ. of Colorado, Denver
- Pacific NW National Lab
- SoftCell, Inc.
- Young Living, Inc.

## Outreach

- Stockman Grass Farmer Magazine [Article](#)
- ScienceNews [Article](#) featuring work
- [Article](#) on my marine mycology discoveries
- Annual science fair judge
- 6th-grade teacher and inquiry-based lesson planning (2011-2012)

## Peer review

- NSF panel reviewer & *ad hoc* reviewer
- NSF GRFP
- BARD US-Israel Agr. Dev. Fund
- Journals:
  - Soil Biol. and Biochem. (Distinguished), PeerJ, Pedobiologia (Distinguished), Oikos, ISME Journal, Fungal Ecology (Distinguished), Molecular ecology, Ecology and Evolution, American Fern Journal, New Phytologist, Phytobiomes