

GEOFF ZAHN, PHD

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

Translational microbial ecology | Microbiomes and symbiosis



PROFESSIONAL APPOINTMENTS

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

EDUCATION

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|------|---|--------------------|
| 2015 | University of Arkansas Ph.D. in Biology | 📍 Fayetteville, AR |
| 2010 | Missouri State University 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
🌐 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 | PI: Faculty-Mentored Experiences for Improving Undergraduate Biology Student Outcomes \$972,287 <div>  NSF (DUE – 1833880) </div> |
| 2020, 2022 | College of Science Dean's Award of Excellence for Scholarship \$5,500 <div>  UVU </div> |
| 2019 | Presidential Fellowship for Faculty Scholarship \$8,000 <div>  UVU </div> |
| 2018 2017 | PI: SEED: Engaging undergraduates in advanced research \$30,000 <div>  UVU </div> |
| 2018 | PI: New methods to survey fungal endophytes in endangered cacti \$2,550 <div>  Capitol Reef National Park </div> |
| 2018 | Co-PI: Assessing Undergraduate Research Teams at an Open Enrollment Institution \$29,327 <div>  UVU </div> |
| 2016 | Translational Mycology Postdoctoral Award Plant conservation from a microbial perspective <div>  Mycological Society of America </div> |
| 2015 | Co-PI: Restoration of endangered plants by manipulating foliar fungal symbionts \$40,500 <div>  Oahu Army Natural Resources Program </div> |
| 2014 | Japan Society for the Promotion of Science Travel Award \$750 <div>  Washington, D.C. </div> |
| 2013 | PI: The Importance of microbial interactions to soil carbon cycling on a warming planet \$22,570 <div>  NSF (OISE-1308856) / JSPS (SP01363) </div> |
| Current 2017 | Student Mentee Funding Awards 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 some 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, Prylutskiy 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

📍 Sokendai, 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
- **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