

GEOFF ZAHN, PHD

Translational microbial ecology | Microbiomes and symbiosis



PROFESSIONAL APPOINTMENTS

| | | |
|----------------------|---|----------------|
| Current 2023 | Associate Professor 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: \$1,182,738

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|-------------------|---|--------------------------|
| 2023 2018 | PI: Faculty-Mentored Experiences for Improving Undergraduate Biology Student Outcomes \$972,287 | 📍 NSF (DUE - 1833880) |
| 2022 | College of Science Dean's Award of Excellence for Scholarship \$2,750 | 📍 Utah Valley University |

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

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|----------------------|---|---|---------------------------------------|
| 2020 | ● | College of Science Dean's Award of Excellence for Scholarship \$2,750 | 📍 Utah Valley University |
| 2019 | ● | Presidential Fellowship for Faculty Scholarship \$8,000 | 📍 Utah Valley University |
| 2018 2017 | ● | PI: SEED: Engaging undergraduates in advanced research \$30,000 | 📍 Utah Valley University |
| 2018 | ● | PI: New methods to survey fungal endophytes in endangered cacti \$2,550 | 📍 Capitol Reef National Park |
| 2018 | ● | Co-PI: Assessing Undergraduate Research Teams at an Open Enrollment Institution \$29,327 | 📍 Utah Valley University |
| 2016 | ● | Translational Mycology Postdoctoral Award Plant conservation from a microbial perspective | 📍 Mycological Society of America |
| 2015 | ● | Co-PI: Restoration of endangered plants by manipulating foliar fungal symbionts \$40,500 | 📍 Oahu Army Natural Resources Program |
| 2014 | ● | Japan Society for the Promotion of Science Travel Award \$750 | 📍 Washington, D.C. |
| 2013 | ● | PI: The Importance of microbial interactions to soil carbon cycling on a warming planet \$12,570 | 📍 NSF (OISE-1308856) / JSPS (SP01363) |
| Current 2017 | ● | Student Mentee Funding Awards 122 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

● 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, ... 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, ... 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 GL, 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, ... 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
- **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](#)

● **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)
- Devel

● **Collaborations**

- National Univ. of Singapore
- Univ. of Hawaii at Manoa
- Stazione Anton Dorhn
- Washington State Univ.
- SUNY Syracuse
- PNNL
- SoftCell, Inc.
- Young Living, Inc.
- Oxford Univ.
- Univ. of Arkansas

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
- 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