Curriculum vitae of

Geoffrey L. Zahn, Ph.D.

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http://gzahn.github.io/

Biology Department
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PROFESSIONAL APPOINTMENTS

2017 - Current Assistant Professor
Utah Valley University – Biology Department

2018 - Current Director of Environmental Biology
GeoDataCrawler Research Institute

2015 - 2017 Postdoctoral Research Associate
University of Hawaii at Manoa – Department of Botany
Lab of: Dr. Anthony Amend

EDUCATION

2015 PhD in Biology – Microbial and Molecular Ecology
University of Arkansas, Fayetteville, AR, USA

2010 Bachelor of Science in Biology – Ecology, Evolution and Systematics
Missouri State University, Springfield, MO, USA

RESEARCH FOCI:

Plant-Microbe interactions
Microbial community responses/feedbacks to climate change
The ecology and ecosystem services of protists and fungi
Factors that shape microbial community formation and function
Linking local microbial and molecular dynamics to global biogeochemical cycles

PUBLICATIONS

(* denotes authors who contributed equally to a paper; † denotes student mentee authors)

Laura Tipton*, **Geoffrey Zahn***, Anthony Amend, Patrick Sheridan, Erin Datlof†, Nicole Hynson. Just passing through: neither time nor environment affect fungal aerobiota over a 13-year time series at the Mauna Loa Observatory. In Press. *PNAS*. https://doi.org/10.1073/pnas.1907414116

Benjamin J. Wainwright, **Geoffrey L. Zahn**, Joshua Zushi†, Nicole Li Ying Lee, Jillian Lean Sim Ooi, Jen Nie Lee, Danwei Huang. 2019. Seagrass-associated fungal communities show distance decay of similarity that has implications for seagrass management and restoration. *Ecology and Evolution*. https://doi.org/10.1002/ece3.5631

Wainwright, B. J., Bauman, A. G., **Zahn, G. L.**, Todd, P. A., & Huang, D. (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. *Marine Biodiversity*. https://doi.org/10.1007/s12526-019-00992-6

Benjamin J. Wainwright,Lutfi Afiq-Rosli, **Geoffrey Zahn**, Danwei Huang. 2019. Characterisation of coral-associated bacterial communities in an urbanised marine environment shows strong divergence over small geographic scales. *Coral Reefs*, 1-10. https://doi.org/10.1007/s00338-019-01837-1

Geoffrey Zahn, Anthony Amend. 2019. Foliar fungi alter reproductive timing and allocation in Arabidopsis under normal and water-stressed conditions. *Fungal Ecology*, *41*, 101–106. https://doi.org/10.1016/j.funeco.2019.04.002

Wainwright BJ., **Zahn GL.**, Arlyza IS., Amend AS. 2018. Seagrass-associated fungal communities follow Wallace's line, but host genotype does not structure fungal community. *Journal of Biogeography.* DOI:10.1111/jbi.13168.

Datlof, E. M., Amend, A. S., Earl, K., Hayward, J., Morden, C. W., Wade, R., **Zahn, GL**, Hynson, N. A.. 2017. Uncovering unseen fungal diversity from plant DNA banks. PeerJ, 5, e3730. DOI: 10.7717/peerj.3730

Geoffrey Zahn, Anthony S Amend. 2017. Foliar microbiome transplants confer disease resistance in a critically-endangered plant. *PeerJ* **5**: e4020. DOI: 10.7717/peerj.4020

Wainwright BJ., **Zahn GL**., Spalding HL., Sherwood AR., Smith CM., Amend AS. 2017. Fungi associated with mesophotic macroalgae from the ‘Au‘au Channel, west Maui are differentiated by host and overlap terrestrial communities. *PeerJ* 5:e3532. DOI: 10.7717/peerj.3532.

Geoffrey Zahn, Rota Wagai, Seiichiro Yonemura. 2016. The effects of amoebal bacterivory on carbon and nitrogen dynamics depend on temperature and soil structure interactions. *Soil Biology and Biochemistry*, 94: 133-137. DOI: http://10.1016/j.soilbio.2015.11.021

Geoffrey Zahn, Steven L. Stephenson, Frederick W. Spiegel. 2014. Ecological distribution of protosteloid amoebae in New Zealand. *PeerJ* 2:e296; DOI: 10.7717/peerj.296

Miriam De Haan, Christine Cocquyt, Alex Tice, **Geoffrey Zahn**, Frederick W. Spiegel. 2014. First records of Protosteloid Amoebae (Eumycetozoa) from the Democratic Republic of the Congo. *Plant Ecology and Evolution,* 147:1, 85-92

Erin R. Murphy, Jacob Boxberger, Robert Colvin, Suk Je Lee, **Geoffrey Zahn**, Fred Loor, Kyoungtae Kim. 2011. Pil1, an eisosome organizer, plays an important role in the recruitment of synaptojanins and amphiphysins to facilitate receptor-mediated endocytosis in yeast. *European Journal of Cell Biology*, 90:10, 825-833

In Review

Darcy JL, Cobian G, Swift S, **Zahn G**, Perry B, Amend AS. Fungal communities living within leaves of native Hawaiian plants are structured by landscape rather than host identity. In review.

Ben Wainwright; Lutfi Afiq-Rosli; **Geoffrey Zahn**; Danwei Huang. Coral-associated bacteria in an urbanised marine environment show fine-scale community structure. In review, October 2018.

Cameron P. Egan*, Jerry Koko*, Geoffrey Zahn, Sean O.I. Swift, Anthony S. Amend, Nicole A. Hynson. Restoration of the endangered Hawaiian mint Phyllostegia kaalaensis’ mycobiome increases its pathogen resistance

Wainwright BJ; Zahn GL; Afiq-Rosli L; Tanzil JTI; Huang D. Host age is not a consistent predictor of coral-associated microbial diversity

In Preparation

Spencer McGee, Alyssa Tidwell, Natalie Blaine, Erin Riggs, Geoffrey Zahn. Recovery of soil fungal communities along a decadal fire chronosequence.

Harrison Haws, Joseph Jimenez, Geoffrey Zahn. The core human oral microbiome is resilient to lifestyle and demographics in healthy adults.

Joshua Zushi, Geoffrey Zahn. Commercial dental treats alter the canine oral microbiome.

Jonathan Wasden, Geoffrey Zahn. Fine-scale time-series reveals fungal colonization of soils after burns of increasing intensities.

Reagan Dodge, Geoffrey Zahn. Predator-prey interactions change bacterial community structure in warming soils.

Geoffrey Zahn, Reagan Dodge*, Alyssa Tidwell*, Benjamin Wainwright. Coral-associated bacteria in the remote Chagos Archipelago are influenced by bleaching events.

TECHNICAL REPORTS

Geoffrey Zahn and Tyler Hacking. 2019. Development of non-detrimental methods to survey fungal endophytes in endangered cacti. Capitol Reef National Park Field Station Report.

Geoffrey Zahn, Anthony Amend. 2017. Role of fungal endophytes and epiphytes in endangered species conservation. O'ahu Army Natural Resources Program Year-End Report

Geoffrey Zahn, Anthony Amend. 2016. Molecular assessment of wild Achatinella mustelina diet. O'ahu Army Natural Resources Program Year-End Report

Geoffrey Zahn, Anthony Amend. 2015. Molecular assessment of wild Achatinella mustelina diet. O'ahu Army Natural Resources Program Year-End Report

CODE CONTRIBUTIONS AND TUTORIALS

Method for creating QIIME-compatible taxonomic databases from any subset of NCBI data.
https://doi.org/10.5281/zenodo.3688556

R for exploratory data analysis course
https://github.com/gzahn/Data_Course

Collection of custom bioinformatics tools
https://github.com/gzahn/tools

http://geoffreyzahn.com/blog-archive

AWARDS AND FUNDING (Total: $1,164,037)

2020 College of Science Dean's Award of Excellence for Scholarship – Utah Valley University (**$2,750**)

2019 Presidential Fellowship for Faculty Scholarship – Utah Valley University (**$8,000**)
PI: “Soil microbial predation in a changing climate”

2018 NSF (DUE – 1833880) (**$972,287**)
PI: “Faculty-Mentored Experiences for Improving Undergraduate Biology Student Outcomes”

2018 SEED Grant for Engaged Learning (**$9,597**) – Utah Valley University
PI: “Engaging undergraduates in advanced research – Year two”

2018 Capitol Reef National Park Field Station Grant (**$2,550**)
PI: “Development of non-detrimental methods to survey fungal endophytes in endangered cacti”

2018 GREEN Grant (**$29,327**) – Utah Valley University
Co-PI: “Assessing the Implementation of Undergraduate Research Teams at an Open Enrollment Institution”

2018 SEED Grant for Engaged Learning (**$9,650**) – Utah Valley University
PI: “Engaging undergraduates in advanced research: The functional roles of halophilic fungi along a salinity gradient in the Great Salt Lake”

2016 Mycological Society of America Translational Mycology Postdoctoral Award (**$2,500**)
"Plant conservation from a microbial perspective"

2015 Oahu Army Natural Resources Program – Rare Plant Management (**$40,500**)
Co-Investigator and Writer - "Restoration of critically endangered Hawaiian native plants by understanding and manipulating foliar microbial symbionts"

2014 Japan Society for the Promotion of Science (JSPS) Alumnus Travel Award (**$750**)
Presentation: “Harnessing eukaryotic microbes in agricultural soils for reduced carbon turnover”

2014 Dept. of Energy Joint Genome Institute IMG Workshop Travel Award (**$425**)

2013 JSPS Summer Research Fellowship (JSPS-SP01363) (**$12,500**)
Co-P.I. - "The Importance of Microbial Interactions to Soil Carbon Cycling on a Warming Planet"

2013 NSF EAPSI Grant (OISE-1308856) (**$5,070**)
P.I. - "The Importance of Microbial Interactions to Soil Carbon Cycling on a Warming Planet"

2013 *Clean Air – Cool Planet* Climate Fellowship (**$5,000**)
Fellowship: “Assessing the status of USDA Green Ribbon Schools nationally”

2011 Mycological Society of America Travel Award (**$350**)

2011 NSF GK-12 Fellowship (**$30,500**)
Fellowship: "Inquiry and Innovative Thinking by Design"

STUDENT MENTEE FUNDING

2020 Undergraduate Research Grant (URSCA) awarded to advisees Reagan Dodge and Natalia Backman (**$2,900**)
Converting cellulose waste into gourmet edible mushrooms

2020 Scholarly Activities Committee (SAC) Grant awarded to Sarah van Dijk (**$1,833**)
PI: “Determining the effect of different pathogens on *Arabidopsis thaliana* root architecture”

2020 Scholarly Activities Committee (SAC) Grant awarded to Logan Wesemann (**$439**)
PI: “Limiting ice nucleation from *P. syringae* using biocontrol”

2020 Scholarly Activities Committee (SAC) Grant awarded to Erika Lakin (**$1,440**)
PI: “Fungal endophytes and the hybrid advantage in crucifers”

2019 Undergraduate Research Grant (URSCA) awarded to advisee Connor Glassford (**$743**)
PI: “Novel antimicrobials from extremophilic fungi”

2019 Undergraduate Research Grant (URSCA) awarded to advisee Clayton Rawson (**$1,460**)
PI: “Survey of extremophilic fungi in Utah”

2019 Undergraduate Research Grant (URSCA) awarded to advisee McKenzie Bell (**$954**)
PI: “Fungal bioremediation of microplastics”

2019 Undergraduate Research Grant (URSCA) awarded to advisee Katia L’Ecuyer (**$854**)
PI: “Produce aisle endophytes”

2019 Board of Trustees Research Scholarship Award to advisee Jonathan Wasden (**$6,000**)
PI: “Forest fires and soil fungal recovery”

2019 Undergraduate Research Grant (URSCA) awarded to advisee Jonathan Wasden (**$1,987**)
PI: “Forest fires and endophytes”

2019 Undergraduate Research Grant (URSCA) awarded to advisees Natiri Swenson (**$840**)
PI: “Pathogenic nematode density under various orchard management strategies”

2018 Undergraduate Research Grant (URSCA) awarded to advisees Alyssa Tidwell and Jenni Lawrence (**$2,970**)
PI: “Fungal and bacterial community structure during wetland recovery”

2018 Undergraduate Research Grant (URSCA) awarded to advisees Spencer McGee (**$1,740**)
PI: “Soil microbial responses after the Pole Creek Fire in Utah”

2018 Undergraduate Research Grant (URSCA) awarded to advisee Garrett Matthews (**$978**)
PI: “Examining the roles of endophytes in leaf decomposition”

2018 Undergraduate Research Grant (URSCA) awarded to advisees Bryce Brunetti and Jordan Bayly (**$833**)
PI: “Underwater heroes: finding a chytrid antagonist”

2018 Undergraduate Research Grant (URSCA) awarded to advisees Nicholas Long and Harrison Haws (**$3,000**)
PI: “Lifestyle determinants of the human oral mycobiome”

2018 Undergraduate Research Grant (URSCA) awarded to advisees Alyssa Tidwell and Spencer McGee (**$3,000**)
PI: “Community assembly of soil fungi within a fire chronosequence”

2018 Undergraduate Research Grant (URSCA) awarded to advisee Bryce Brunetti (**$350**)
PI: “Construction of a mock fungal community for high-throughput amplicon research”

PRESENTATIONS

Invited Seminars:

2019 “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, AR, USA

2018 “The causes and consequences of fungal community structure”
Missouri State University, USA

2016 “Picky Eaters: Prey choice by soil protists is altered by temperature and soil structure”
Cornell University, Ithaca, NY, USA

2015 **“***Effects of belowground trophic complexity on carbon cycling under changing climatic and edaphic conditions”*
Joint Genome Institute, Walnut Creek, CA, USA

2015 *"The functional and distributional ecology of mycetozoans under changing edaphic and climatic dynamics"* Climate Impact Research Center, Abisko, Sweden

2014 "*Public science literacy and targeted environmental initiatives*" NWA Environmental Programs Symposium

2014 "*The functional and distributional ecology of slime molds in a changing climate*" NIAES, Tsukuba, Japan

2013 "*The Ecology of Soil Mycetozoa*" Japan Agency for Marine-Earth Science and Technology, Yokosuka, Japan

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

Posters and Talks:

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

2014 "*Amoebae in warming soils: interactive effects of the microbial food web and environmental factors on nutrient cycling in a changing climate*" A2C Research Symposium, Fayetteville, AR, 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 "*Application of high-throughput sequencing may explain carbon dynamics under predation and warming gradients via soil community shifts"* JSPS Multidisciplinary Science Forum 4; Washington, D.C., USA

2014 "*Using metagenomics and metatranscriptomics to uncover mechanisms of soil communities' effects on carbon cycling under warming conditions*" DOE Joint Genome Institute – Microbial Genomics and Metagenomics Workshop; Walnut Creek, 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; Fairbanks, AK, USA

2010 "*Pil1's Role on Regulating Membrane PIP2 Level"* INBRE Conference; Fayetteville, AR, USA

2010 "*The Effects of Prescribed Fire on Overwintering Fungal Abundance and Diversity: A Baseline Study*" CNAS Undergraduate Research Symposium; Springfield, MO, USA

2009 *"Endocytic Roles of Pil1, the Main Organizer of Eisosomes"* Arkansas INBRE Research Conference; Fayetteville, AR, USA

PROFESSIONAL DEVELOPMENT AND ACADEMIC SERVICE

2019 Workshop to enhance collaboration between the US and Indonesia. Bogor, Indonesia. http://biodiversity.ipb.ac.id/

2019 NSF Panel Reviewer

2018 – Current Faculty Senate – Utah Valley University

2018 Faculty search committees for positions in Environmental Microbiology and Molecular Field Botany - UVU

2015 -- 2016 Endangered species conservation – Collaboration with US Army Environmental Division and the 'Oahu Natural Resources Program, Hawaii

2014 – 2015 Course Development – Online Biology Lab
University of Arkansas

2013
May – Aug. International Research – Soil Physiology and Ecology
National Institute for Agro-Environmental Sciences, Tsukuba, Japan

2013 – 2016 IUCN Species Survival Commission – Myxomycete group

2012
Jul. – Aug. Field Research – Tropical Lichen Ecology
Organization for Tropical Studies, Costa Rica

2011 – 2012 National Science Foundation GK-12 Teaching Fellow

Jun. – May University of Arkansas; Owl Creek Middle School, Fayetteville, AR

2010 Undergraduate Research Assistant – Forest Fire Ecology
Jan. – Dec. Missouri State University Dept. of Biology

2009 Undergraduate Research Assistant – Yeast Genetics
Jan. – Dec. Missouri State University Dept. of Biology

MENTORING AND TEACHING EXPERIENCE

Mentorship

Undergraduate student mentor (30 students)
Graduate Student Mentor (4 Masters, 3 PhD)

Courses

Introduction to undergraduate research – UVU (Developed and taught)
Research methods, graduate school preparation, lab rotations (1 semester)

Mycology – UVU (Developed and taught)
Integrated lecture/lab with molecular methods (1 semester)

Majors' Biology II – UVU (Developed and taught)
Large-format lecture (5 semesters)

Introduction to Data Analysis in R – UVU (Developed and taught)
Project-based BASH and R training with applied biostatistics (2 semesters)

Plant Pathology – UVU (Developed and taught)
Research-based course design (1 semester)

Online Biology Lab (Non-majors) – UArk (Developed and taught)
Developed, administered, and evaluated simulation-based labs for non-majors (1 semester)

Principles of Biology (Honors Undergraduate) – UArk Teaching Assistant
Lab for biology majors (5 semesters)

Comparative Botany (Graduate level) – UArk Teaching Assistant
Lab component (1 semester)

Mycology (Graduate level) – UArk Teaching Assistant
Lab component (1 semester)

Experimental Design (Undergraduate) – UArk Teaching Assistant (Taught)
Computer lab component (1 semester)

6th Grade Science and Math (NSF GK-12 Teaching Fellow)
Developed and taught inquiry-based lessons (1 year)

ACADEMIC AND OTHER SOCIETIES (Active participant)

International Society for Microbial Ecology
Mycological Society of America
International Society for Fungal Conservation
Japan Society for the Promotion of Science Alumni Association
International Union for Conservation of Nature (IUCN) – Species Survival Group (Myxomycetes)

OUTREACH & MEDIA

2019 "Excuse me… do you have a moment to talk about endophytes?" Stockman Grass Farmer Magazine Aug. 2019. https://bit.ly/2KsYlBB

2019 Funded S-STEM proposal featured by NSF at Council of Undergraduate Research Dialogues plenary session – Arlington, VA

2018	ScienceNews article on plant microbiomes featuring endangered plant work https://www.sciencenews.org/article/plant-microbes-crops-food-endangered-species?tgt=nr
2018	**“**In plaats van spuiten, planten helpen met micro-organismen” https://bit.ly/2IeHIr4
2018	Trailside STEM Night – Park City, UT
2017	“Researchers find scores of potentially new species of fungi in deep waters off Maui” https://bit.ly/318xKQm
2017	Judge **-** Windward District Science and Engineering Fair, HI
2016	Research spotlight at 2016 IUCN Congress - "Using fungi to save endangered plants"
2016	Hawaii GENE-ious K-12 Curriculum Development
2014	Ten Thousand Microscopes Beta Tester – K-12 Content Generator
2011 – **2015**	Judge – NWA Regional Science Fair
2008 – **2009**	James River Basin Partnership Science Committee, Springfield, MO
2007	Research Technician - Missouri State University Greenhouse
2006	Volunteer Ecologist - Reserva Bosque Nuboso Santa Elena, Costa Rica

PEER REVIEW

Reviewer for:	Soil Biology and Biochemistry (Distinguished Reviewer) PeerJ Pedobiologia (Distinguished Reviewer) Oikos ISME Journal Fungal Ecology (Distinguished Reviewer) Molecular ecology Ecology and Evolution