

# JOSEPH MADISON

## Curriculum Vitae

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### EDUCATION

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Ph.D. Biological Sciences (2018). University of South Dakota, Department of Biology, Vermillion, SD.  
Dissertation: *Microbial Community Characterization and Restructuring for the Amelioration of Amphibian Chytridiomycosis*

B.S. Chemistry (2014). University of Wisconsin – Superior, Department of Natural Sciences, Superior, WI.

B.S. Biology (2013). University of Wisconsin – Superior, Department of Natural Sciences, Superior, WI.

### APPOINTMENTS AND AFFILIATIONS

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Visiting Scholar (2022–present). Knight Lab, University of California, San Diego, School of Medicine, Department of Pediatrics, San Diego, CA.

NSF Postdoctoral Research Fellowship, Biological Collections: Host-microbiome Ecology (2020–present).  
Sponsor: Doug Woodhams, University of Massachusetts Boston, Boston, MA.

Postdoctoral Research Fellow (2019). Mayo Clinic Microbiome Program, Center for Individualized Medicine, Department of Surgery, Rochester, MN.

Visiting Fellow (2018). Minnesota Center for Philosophy of Science, University of Minnesota, Twin Cities, Minneapolis, MN. Project: *Host-Microbiome Species Concepts*

High Performance Research Computing Assistant (2016–2018). Research Computing Group, Information and Technology Services, University of South Dakota, Vermillion, SD.

### PUBLICATIONS

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**Madison, J.D.** (in prep) Constraint Drift as a Mode of Potentiation for Macroevolutionary Novelty.

**Madison, J.D.**, B. LaBumbard, & D.C. Woodhams. (in prep) Comparison of Museum Specimen Gut Microbiota using Shotgun Metagenomic and 16S rRNA Gene Sequencing.

**Madison, J.D.**, \*M. Butterfield, D.R. Davis, & J. Kerby (in press) Spatial variation of False Map Turtle (*Graptemys pseudogeographica*) bacterial microbiota in the Lower Missouri River, USA. *Journal of Herpetology*

Woodhams, D.C., **J.D. Madison**, M.C. Bletz, J. McCartney, B.C. LaBumbard, R. Whetstone, N.B. McDonnell, K. Preissler, J. Sabino-Pinto, J. Piovia-Scott (2021) Responsible Biosecurity and Risk Mitigation for Emerging Pathogen Research. *Diseases of Aquatic Organisms*, 147, 141-148.

**Madison, J.D.** (2021). Stochasticity and Randomness in Community Assembly: Real or As-If?. *Msystems*, 6(5), e00938-21.

†Crooks, T.A. †**J.D. Madison**, D.M. Walsh, W.G. Herbert, P.R. Jeraldo, N. Chia, W.A. Cliby, S.H. Kaufmann, & M. Walther-Antonio (2021) *Porphyromonas somerae* Invasion of Endometrial Cancer Cells. *Frontiers in Microbiology*, 12, 2006.

Multinu, F., J. Chen, **J.D. Madison**, M. Torres, J. Casarin, D. Visscher, V. Shridhar, Jamie N. Bakkum-Gamez, M. Sherman, N. Wentzensen, A. Mariani, M. Walther-Antonio. (2020) Analysis of DNA Methylation in Endometrial Biopsies to Predict Risk of Endometrial Cancer. *Gynecologic Oncology* 156(3), 682-688.

**Madison, J.D.**, S.P. Ouellette, E.L. Schmidt, & J.L. Kerby. (2019). *Serratia marcescens* shapes cutaneous bacterial communities and influences survival of an amphibian host. *Proceedings of the Royal Society B*, 286(1914), 20191833.

- Kleinsasser, A.A., S. Pamidighantam, D.M. Jennewein, **J.D. Madison**, M. Christie, E. Abeysinghe, S. Marru & M. Pierce (2019). The USD Science Gateway: A Bridge Between Research and Advanced Computing. In *Proceedings of the Practice and Experience in Advanced Research Computing on Rise of the Machines (learning)* (p. 125). ACM.
- \*Butterfield, M., D.R. Davis, **J.D. Madison**, & J. Kerby (2019) Surveillance of *Ranavirus* in False Map Turtles (*Graptemys pseudogeographica*) along the lower Missouri River, USA. *Herpetological Review* 50(1), 78–80.
- Madison, J.D.**, \*S. Austin, D.R. Davis, & J. Kerby (2018). Bacterial Microbiota Response in *Graptemys pseudogeographica* to Captivity and Roundup® Exposure. *Copeia* 106(4), 580–588.
- Madison, J. D.**, E. Abeysinghe, S. Pamidighantam, S. Marru, M. Christie, D.M. Jennewein, & M. Pierce (2018). Science Gateway Implementation at the University of South Dakota: Applications in Research and Education. In *Proceedings of the Practice and Experience on Advanced Research Computing* (p. 97) ACM.
- Mosher B.A., K.P. Huyvaert, T. Chestnut, J. Kerby, **J.D. Madison**, & L.L. Bailey (2017). Design- and Model-based Recommendations for Detecting and Quantifying an Amphibian Pathogen in Environmental Samples. *Ecology and Evolution* 7(24), 10952–10962
- Madison, J.D.**, \*E. Berg, J.G. Abarca Alvarado, O. Gorbatenko, S. Whitfield, A. Pinto, & J. Kerby (2017). Characterization of *Batrachochytrium dendrobatidis* Inhibiting Bacteria from Amphibian Populations in Costa Rica. *Frontiers in Microbiology*, 8, 290.

\*indicates undergraduate author

†indicates co-first authors

## PRESENTATIONS

### Oral Presentations

- Madison, J.D.**, J. Joubert, A. Galineau, M. Bielcik, A. Salazar. (2022) Making it Micro: evolutionary innovation of endothermic organisms. PhilinBioMed Summer School, June 10<sup>th</sup>, Universite de Bordeaux, Bordeaux, France.
- Madison, J.D.** (2022; virtual) Evolutionary Trends and Microbial Constraints: Reconceptualizing the Metagenomic Toolkit. Knight, Gilbert, & Dorrenstein Joint Lab Meeting. Feb. 28th University of California, San Diego, San Diego, CA, USA.
- Madison, J.D.** (2019) A Farewell to Unity: the case for context in host-microbiota conceptual frameworks. ISHPSSB Meeting, July 10<sup>th</sup>, University of Oslo, Oslo, Norway.
- Madison, J.D.** (2019) Microbial Evolutionary Ecology. CIM Selective Series, Mayo Clinic Alix School of Medicine, April 15<sup>th</sup>, Rochester, MN, USA.
- Madison, J.D.** (2018). Host-associated Microbial Community Characterization and Manipulation in Amphibians and Turtles. Microbiome Program Seminar, Dec. 18<sup>th</sup>, Center for Individualized Medicine at the Mayo Clinic, Rochester, MN, USA.
- Madison, J.D.** (2018). Host-microbiome Extinctions? A Case Study in Amphibian Declines. October 15<sup>th</sup>, Department of Philosophy, University of Minnesota – Twin Cities, Minneapolis, MN, USA.
- Madison, J.D.** (2018). Introduction to Prokaryotic Genomes & Molecular Microbiology. BIOL 475: Introduction to Molecular Biology. March 22, University of South Dakota, Vermillion, SD.
- Madison, J.D.** (2018) Microbiome Engineering as a Novel Tool for the Amelioration of Amphibian Chytridiomycosis. IdeaFest 2018, April 4<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.
- Madison, J.D.** & J. Kerby (2017) Manipulation of Bacterial Community Structure Provides Host Benefits Against Disease. Amphibian Pathogens Annual Meeting, November 17–18, Arizona State University, Tempe, AZ, USA.
- Madison, J.D.** & J. Kerby (2017) Microbiome Engineering as a Novel Tool for the Amelioration of Amphibian Chytridiomycosis. American Society for Microbiology Regional Conference, St. Norbert College, De Pere, WI, USA.
- Madison, J.D.** & D. Jennewein (2017) Cyberinfrastructure and HPC Resources at USD Department of Biology Seminar Series, Sept. 4<sup>th</sup>, University of South Dakota, Vermillion, SD, USA. Beacom School of Business Scholar Series, Sept. 13<sup>th</sup>, University of South Dakota, Vermillion, SD.

- Madison, J.D.** (2017) Evaluating the Role of *Serratia marcescens* in the Inhibition of Amphibian Chytridiomycosis. IdeaFest 2017, April 5<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.
- Madison, J.D.** (2016) Introduction to Supercomputing at USD. Department of Chemistry Seminar Series, September 26<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.
- Madison, J.D.** & J. Kerby (2016) Transcriptomic Response of *Serratia marcescens* to the Amphibian Fungal Pathogen *Batrachochytrium dendrobatidis*. ASM Microbe 2016, General Meeting, June 17<sup>th</sup>, Boston Convention and Exhibition Center, Boston, MA, USA.
- Madison, J.D.** & J. Kerby (2016) Transcriptomic Profiling of *Serratia marcescens* in Response to the Amphibian Fungal Pathogen *Batrachochytrium dendrobatidis*. IdeaFest 2016, April 14<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.
- Madison, J.D.** (2016) Large Dataset Challenges and Frontiers in Conservation Biology: A Case Study in Amphibian Conservation. Early Career Big Data Summit, April 6<sup>th</sup>, University of North Dakota, Grand Forks ND, USA.
- Madison, J.D.** & J. Kerby (2015) Gene expression profiling of the anti-Bd Gammaproteobacteria *Serratia marcescens*. Amphibian Pathogens Annual Meeting, October 31–November 1, Arizona State University, Tempe, AZ, USA.
- Madison, J. D.** (2015) Exploitation of the amphibian microbiome for treatment of the fungal pathogen *Batrachochytrium dendrobatidis*. Ignite Lecture Series, September 14<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.
- Madison, J. D.\***, E. Burkett, & P. Arneson\* (2013) The Influence of *Zoochlorellae* Symbionts on *Paramecium bursaria* Biotic Potential Under Light and Dark Conditions. Undergraduate Research Symposium, May 10<sup>th</sup>, University of Wisconsin – Superior, Superior, WI, USA.
- Madison J.D.\***, M. Schultz\*, & R. Seelke (2013) Can Old Genes Give Rise to New Genes? A Test of the Gene Duplication Hypothesis with *HisB* of *Escherichia coli*. American Society for Microbiology Regional Conference, October 12<sup>th</sup>, South Dakota State University, Brookings, SD, USA.

### Poster Presentations

- Clegg J., N. E. Stone, C. Hamond, H. Hertz, J. D. Busch, J. W. Sahl, K. LeCount, N. Hill, **J.D. Madison**, J.E. Nally, M. Rosenbaum, D.M. Wagner. (2022) Limited dispersal among brown Norway rats in Boston, MA. AZ and S. Nevada branch ASM Conference April 16, 2022. Arizona State University, Tempe, AZ, USA.  
UGRADS Symposium. Apr 22, 2022. Northern Arizona University. Flagstaff, AZ, USA.
- Specht A.\*\*, N.J. Hill, **J.D. Madison**, A.M. Earl, A.J. Pickering, M.H. Rosenbaum (2021) Describing the Geospatial Distribution of Antimicrobial Resistance Genes in the Boston Urban Rat Population. National Veterinary Scholars Symposium. August 4–6. Virtual Meeting.
- Zhu J.E.\*, **J.D. Madison**, M.R. Walther-Antonio (2019) Intracellular Bacteria Competition and Evolution in Eukaryotic Hosts. Wellesley College Science Center Summer Research Program Keynote Lecture & Poster Session. August 1<sup>st</sup>, Wellesley College, Wellesley, MA, USA.
- Kleinsasser A.\*\*, D. Jennewein, **J.D. Madison**, E. Abeyasinghe, S. Pamidighantam, M. Christie, S. Marru, M. Pierce (2019) The USD Science Gateway: A Bridge Between Research and Advanced Computing. Practice and Experience in Advanced Research Computing 2019, Rise of the Machines. July 27–Aug 1, Hyatt Regency Chicago, Chicago, IL, USA.
- Madison J.D.**, E. Abeyasinghe, S. Pamidighantam, M. Christie, S. Marru, D. Jennewein, & M. Pierce (2018) Implementation of a Science Gateway at USD: Applications for Research and Education. Eastern South Dakota Research Symposium. May 30<sup>th</sup>, Sanford Research Center, Sioux Falls, SD, USA.  
Practice and Experience in Advanced Research Computing 2018. July 22-26, Wyndham Grand Pittsburgh Downtown, Pittsburgh, PA, USA.
- Schmidt, E. L\*, **J. D. Madison**, & J. L. Kerby (2018) Test of Key Pathways in Protective Bacteria Against a Deadly Fungal Pathogen using Blanchard's Cricket Frogs. IdeaFest 2018, April 5<sup>th</sup>, University of South Dakota, Vermillion, SD, USA.

Davis, D.R., S. Austin\*, **J.D. Madison**, & J. Kerby (2018). Effects of Glyphosate on the Gut Microbiota of *Gratemys pseudogeographica*. IdeaFest 2018, April 5th, University of South Dakota, Vermillion, SD, USA.

**Madison J.D.** & D. Jennewein (2017) High-Performance Computing and Cyberinfrastructure Resources at the University of South Dakota. Central Region IdeA Conference. June 9<sup>th</sup>, Premier Center, Sioux Falls, SD, USA.

VA Research Day, May 16<sup>th</sup>, Sioux Falls Veterans Affairs Clinic, Sioux Falls, SD, USA.

**Madison J.D.\***, R. Miller\*, M. Mohr\*, & A. Nider\* (2010) Complete Watershed Assessment of Kankapot Creek and Black Otter Creek. Posters in the Rotunda, May 5<sup>th</sup>, Capitol Rotunda, Madison, WI, USA.

\*Indicates Undergraduate Student

\*\*Indicates Graduate Student

## GRANTS AND FELLOWSHIPS

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### External

National Science Foundation

Title: Supplemental

Amount Requested: \$69,000

Role: Principal Investigator

Status: Funded (No. 2141607)

National Science Foundation

Title: NSF Postdoctoral Fellowship in Biology FY 2019: Host-Microbiome Ecology

Amount Requested: \$138,000

Role: Principal Investigator

Status: Funded ( No. 1907311)

National Science Foundation Travel Award (No. 1656206), ISHPSSB 2019, J.D. Madison \$780

Performance and Experience in Advanced Research Computing 2018 Advisory Committee, Student Travel Award, J.D. Madison, \$1100.

### Internal

Nelson Family Research Fellowship, USD Foundation, Fall 2018. J.D. Madison \$10500.

Matthew A. Johnson Memorial Travel Award, USD Foundation, Summer 2018. J.D. Madison \$845.

Supplemental Research Grant, College of Arts & Sciences, University of South Dakota, Spring 2018.

J.D. Madison \$500.

Research and Creativity Grant. Graduate School, University of South Dakota, Fall 2017. J.D. Madison \$500.

Raymond D. Dillon Travel Award. Department of Biology, University of South Dakota, Summer 2017. J.D. Madison \$340.

Research and Creativity Grant. Graduate School, University of South Dakota, Fall 2016. J.D. Madison \$750.

Research and Creativity Grant. Graduate School, University of South Dakota, Fall 2016. J.D. Madison \$500.

Raymond D. Dillon Travel Award. Department of Biology, University of South Dakota, Summer 2015. J.D. Madison \$600.

John W. Carlson Research Grant. College of Arts and Sciences, University of South Dakota, Spring 2015. J.D. Madison. \$3500.

Scholarly and Creative Activity Fellowship, University of Wisconsin-Superior, Undergraduate Summer Research, Research Fellowship. Spring 2013. J.D. Madison. \$4000.

Undergraduate Research Grant, University of Wisconsin-Superior, Undergraduate Summer Research, fall 2012. J.D. Madison. \$500.

## TEACHING EXPERIENCE

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Coordinator, History of Biology Interest Group, Boston, MA.

Summer 2020, Summer 2021

Guest Lecturer, Disease Ecology, University of Massachusetts Boston (2020)

K–12 Substitute Teacher, Brillion Public Schools, Brillion, WI (2019–2020)

Ad Hoc Lecturer, Mayo Clinic Alix School of Medicine, Rochester, MN (2019)

Instructor of Record, Department of Biology, University of South Dakota, Vermillion, SD

Fall 2014 General I Biology Laboratory (BIOL 151L)

Fall 2015 General I Biology Laboratory (BIOL 151L)

Spring 2016 General Biology II Laboratory (BIOL 153L)

Teaching Assistant, Department of Biology, University of South Dakota, Vermillion, SD

Spring 2015 Genetics (BIOL 471)

Spring 2015 Plants and Civilization Laboratory (BIOL 407L)

Laboratory Assistant, Natural Sciences Department, University of Wisconsin – Superior, Superior, WI

Fall 2013 General Chemistry I Laboratory (CHEM 105L)

## MENTORSHIP

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Taylor Crooks (Ph.D. Student, University of Minnesota, Twin Cities) Project: Intracellular Activity of *Porphyromonas somerae*

Jade Zhu (Wellesley College) Project: Intracellular Bacteria Evolution.

Shaylyn Austin (Research Assistant, Tuanan (Borneo) Orangutan Research Station, REU Fellow) Project: False Map Turtle Declines on the Missouri River

Emme Schmidt (current M.D. student UNMC, CURCs Grant recipient, Summer UDiscover Fellowship recipient) Honors Thesis: Amphibian Microbiomes: A Novel Tool for the Amelioration of Amphibian Chytridiomycosis

Madeline Butterfield (D.V.M./Ph.D. Student, Kansas State University, CURCS Grant recipient, Summer UDiscover Fellowship recipient) Honors Thesis: Spatial and Temporal Dynamics of *Graptemys pseudogeographica* and Associated Microbiota

Benjamin Hawkins (U.S. Department of Defense) Project: Methodological Improvement of Freeze Substitution for Scanning Electron Microscopy

Elizabeth Berg (Knauss Fellow, NOAA Sea Grant) Honors Thesis: An Examination of Microbiome Interactions of the Emerging Fungal Pathogen, *Batrachochytrium dendrobatidis*, and Bacteria on Relict Populations of Costa Rican Amphibians

Paige Arneson (Ph.D. Student, Mayo Clinic) Project: The Influence of *Zoochlorellae* Symbionts on *Paramecium bursaria* Biotic Potential Under Light and Dark Conditions

\*Current position is listed followed by awards received while mentored and research/thesis project.

## FEATURED RESEARCH IN NEWS AND MEDIA

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Uterine microbe found to have disease-causing behavior in endometrial cancer. 2021. Susan Murphy *Advancing the Science* <https://advancingthescience.mayo.edu/2021/09/01/uterine-microbe-found-to-have-disease-causing-behavior-in-endometrial-cancer/>

## AWARDS AND HONORS

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John W. Carlson Research Award

University of Wisconsin Superior Dean's List  
Undergraduate Oral Presentation Award, American Society for Microbiology North  
Central Branch Meeting  
Undergraduate Research, Scholarship, and Creative Activity Award

## SERVICE

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### Manuscript Review

*Nature Ecology & Evolution* (2021)  
*Microbial Ecology* (2021)  
*Diseases of Aquatic Organisms* (2020, 2021, 2022)  
*Molecular Ecology* (2020)  
*PeerJ* (2019)  
*Journal of Zoo and Wildlife Medicine* (2019)  
*Copeia* (2018)  
*Journal of Medical Microbiology* (2017, 2018)  
*Hydrobiologia* (2017)

Fundraising and Education Committee Member, Institute for Social Ecology (2020-present)

NSF-XSEDE Student Champion (2017-2018)

Instructional Support; Software Carpentry Workshop-South Dakota, USD Sanford School of Medicine  
Health Sciences Center, Sioux Falls, SD, June 29-30, 2018.

High School Outreach, Science and Epistemology, Tea Area High School, Tea, SD, December 5th, 2017

Programming Coordinator, Lawrence Brothers Science Camp, Vermillion, SD, July 10-14, 2017

Graduate Student Representative – University Libraries Committee (2017-present)

President – Graduate and Professional Student Association (2017)

Vice President – Graduate and Professional Student Association (2016)

Senator – University of South Dakota Faculty Senate (2016-2017)

Representative – University of South Dakota Graduate Council (2016)

Graduate Student Representative – University of South Dakota Budget Committee (FY 2016)

Poster Presentation Judge - It's All About Science Research Poster Competition, Sanford Research,  
Sioux Falls, SD, June 11th, 2016

Science Night Outreach, University of Wisconsin – Superior, Superior, WI, April 19

Lake Sturgeon Registration and Aging, Wisconsin Department of Natural Resources, February, 2010

## PROFESSIONAL AFFILIATIONS

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American Society for Microbiology

International Society for the History, Philosophy, and Social Studies of Biology

International Society for Microbial Ecology

Society for the Study of Amphibians and Reptiles

## CERTIFICATIONS

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PADI Advanced Open Water Diver, Diver No. 1901UO6647

WDNR Boater Safety (NASBLA Certified), Snowmobile Safety, ATV Safety

## REFERENCES

Please contact me for reference information.