

# Allison R Mason, PhD

MICROBIOLOGIST

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## Summary

I’m a microbial ecologist with experience in computational biology and management of multivariate projects. My research encompasses soil microbial ecology and terrestrial vertebrate decomposition. I have experience with multiple programming languages, with an expertise in R and execution of microbiome data analysis and package development. I’m passionate about open source science, reproducible research, and teaching computational skill to individuals of all levels.

## Skills and Expertise

Computational	Research	Laboratory
R – R Markdown – R Package Development – Quarto –Git/Github – Conda – Unix/zsh – Python – C++ – SQL – Biostatistics – Reproducible Research – Machine learning	Soil sampling/Field research – Amplicon Sequencing – Data Analysis/Visualization – Soil microbiome/necrobiome – Metatranscriptomics – Metabolomics	DNA/RNA extraction – PCR/qPCR/RT-qPCR – Cell culture – Fluorometric assays – Cell enumeration – media/solution preparation – Cloning – Gel electrophoresis – Western blot

## Experience

### Biologist

U.S. Geological Survey

RESTON MICROBIOLOGY LAB

Nov 2024 - Feb 2025

- Conducted laboratory experiments to better understand microbial manganese-cycling in ecosystems impacted by oil and gas production.
- Conducted laboratory experiments to better understand microbial sulfur-cycling in ecosystems impacted by acid mine drainage.
- Created a center code club to teach early career scientists R language skills.
- Oversaw laboratory operations.
- Developed, managed, and executed data analysis workflows.

### Postdoctoral Research Fellow (remote)

University of Michigan

SCHLOSS LAB

Sep 2022 - Nov 2024

- Development of an R package for microbiome and multi-omics research/data analytics.
- Project Team Lead, including oversight and management of progress for masters-level bioinformaticians.
- Expanded foundational knowledge of metabolomics.
- Cultivated skills in reproducible research, markdown, git/github, quarto, data analysis.
- Taught computational skills to coding beginners at institutional workshops.

### Graduate Research Assistant

University of Tennessee-Knoxville

DEBRUYN LAB

Aug 2017 - Aug 2022

- Conducted DNA extractions and 16S/ITS amplicon sequencing to characterize soil microbial succession during terrestrial vertebrate decomposition.
- Led a project characterizing soil microbial gene expression via metatranscriptomics.
- Managed multivariate datasets while gaining computational skills including Mothur, R, unix, conda, etc.
- Developed and executed methods for soil and fluid samples collection.
- Measured soil physical and chemical parameters via soil extractions and fluorometric assays.
- Managed and collaborated on multiple field experiments: responsible for preparing and executing field sampling.
- Navigated, communicated, and collaborated with interdisciplinary research groups to accomplish grant aims and publication.

### Intern (biology)

U.S. Geological Survey

OHIO WATER MICROBIOLOGY LABORATORY

Jul 2015 - Jul 2017

- Handled and prepared water and environmental samples from across the country for various tests such as: enumeration of enterococci, aerobic endospores, and virus plaques (1601 and 1602) and multiple source tracking.
- Analyzed and reported test results.
- Prepared solutions and media and maintained the lab.

## Undergraduate Researcher

BORIS-LAWRIE LAB

The Ohio State University

Jan 2014 - May 2015

- Learned about protein-protein interactions to understand a suspected gene splicing product.
- Applied techniques such as cell culture and gene cloning (plasmid and site directed mutagenesis).
- Acquired skills in RT-PCR, western blotting, gel electrophoresis, and maintaining cell lines.

## Education

### PhD Microbiology

DEPARTMENT OF MICROBIOLOGY

- Advisor: Jennifer DeBruyn

University of Tennessee-Knoxville

Aug 2017 - Aug 2022

### BS Microbiology

COLLEGE OF ARTS AND SCIENCES

- Minor: Forensic Science

The Ohio State University

Aug 2013 - May 2017

## Teaching and Mentorship

### Teaching

#### Workshop on R, the Unix Shell, & Git/GitHub

U-M CARPENTRIES

Dec 2023

#### Workshop on R, the Unix Shell, & Git/GitHub

U-M CARPENTRIES

Mar 2023

#### BIOL160 Cellular and Molecular Biology

UNIVERSITY OF TENNESSEE-KNOXVILLE

Department of Biochemistry &  
Cellular & Molecular Biology

Aug 2022 - Jan 2023

#### BIOL229 General Microbiology Laboratory

UNIVERSITY OF TENNESSEE-KNOXVILLE

Department of Biological Sciences

Aug 2021 - Jan 2023

#### BIOL229 General Microbiology Laboratory

UNIVERSITY OF TENNESSEE-KNOXVILLE

Department of Biological Sciences

Aug 2018 - Jan 2019

#### MICR210 Allied Health Microbiology

UNIVERSITY OF TENNESSEE-KNOXVILLE

Department of Microbiology

Aug 2017 - May 2018

### Mentorship

#### Brooke Tally (Honors Undergraduate Student)

DEPARTMENT OF MICROBIOLOGY

University of Tennessee-Knoxville

2021 - 2022

#### Victoria Beard (Honors Undergraduate Student)

DEPARTMENT OF MICROBIOLOGY

University of Tennessee-Knoxville

2019 - 2020

## Publications

1. **Allison R. Mason**, Lois S. Taylor, Naomi E. Gilbert, Steven S. Wilhelm, Jennifer M. DeBruyn. (2025). Microbial Communities Collectively Recycle Cadavers Over One Year of Human Decomposition. *BMC Microbiome* (submitted).
2. **Allison R. Mason**, Gregory Johnson, Jr, Joseph Krampen, Jennifer N. T. Nguyen, Marcy J. Balunas, Patrick D. Schloss. (2025). mpactR: an R adaptation of the metabolomics peak analysis computational tool (MPACT) for use in reproducible data analysis pipelines. *mSphere*. doi: 10.1128/mra.00997-24
3. **Allison R. Mason**, Hayden S. McKee-Zech, Dawnie W. Steadman, Jennifer M. DeBruyn. (2024). Environmental predictors impact microbial-based postmortem interval (PMI) estimation models within human decomposition soils. *PLoS ONE*. doi: 10.1371/journal.pone.0311906
4. Lois S. Taylor, **Allison R. Mason**, Hannah Noel, Michael Essington, Mary Davis, Veronica Brown, Dawnie W. Steadman, Jennifer M. DeBruyn. (2024). Transient hypoxia drives soil microbial community dynamics and biogeochemistry during human decomposition *FEMS Microbiology Ecology*. doi: 10.1093/femsec/fiae119

5. **Allison R. Mason**, Lois S. Taylor, Jennifer M. DeBruyn. (2023). Microbial ecology of vertebrate decomposition in terrestrial ecosystems. *FEMS Microbiology Ecology*. doi: <https://doi.org/10.1093/femsec/fiad006>
6. **Allison R. Mason**, Hayden S. McKee-Zech, Katharina M. Hoeland, Mary C. Davis, Shawn R. Campagna, Dawnie W. Steadman, Jennifer M. DeBruyn. (2022). Body mass index (BMI) impacts soil chemical and microbial response to human decomposition. *mSphere*. doi: <https://doi.org/10.1128/msphere.00325-22>
7. Sarah W. Keenan, Alexandra L. Emmons, Lois S. Taylor, Gary Phillips, **Allison R. Mason**, Amy Z. Mundorff, Ernest C. Bernard, Jennifer M. DeBruyn. (2018). Spatial impacts of a multi-individual grave on microbial and microfaunal communities and soil biogeochemistry. *PLoS ONE*. doi: <https://doi.org/10.1371/journal.pone.0208845>

## Presentations

### Talks

#### **An investigation of intrinsic and extrinsic factors that influence soil microbial succession during human decomposition.**

DISSERTATION DEFENSE

*The University of  
Tennessee-Knoxville*

JUN 2022

#### **Body mass index (BMI) impacts on soil chemical and microbial responses during human decomposition.**

AMERICAN ACADEMY OF FORENSIC SCIENCES (AAFS)

*Seattle, WA*

FEB 2022

#### **Human-associated Microbes in a Subsurface Human Decomposition System.**

WOMEN IN STEM SYMPOSIUM

*University of Tennessee-Knoxville*

NOV 2018

### Posters

#### **Tuning microbial succession-based post-mortem interval estimation models: effect of environmental parameters on model prediction.**

AMERICAN ACADEMY OF FORENSIC SCIENCES (AAFS)

*Seattle, WA*

FEB 2022

#### **Inter-Individual Variation in Soil Chemistry and Microbial Ecology During Human Decomposition.**

AMERICAN ACADEMY OF FORENSIC SCIENCES (AAFS)

*Virtual*

FEB 2021

#### **Variability in Soil Chemistry and Microbial Ecology During Early Stages of Human Decomposition**

SOIL SCIENCE SOCIETY OF AMERICA (SSSA)

*Virtual*

NOV 2020

#### **Assessment of Variability in Soil Chemistry and Microbial Ecology During Early Stages of Human Decomposition.**

AMERICAN SOCIETY OF MICROBIOLOGY (ASM)

*Virtual*

JUN 2020

#### **Spatial Impact of a Multi-individual Grave on Soil Biochemistry and Microbial Ecology.**

SOIL SCIENCE SOCIETY OF AMERICA (SSSA)

*San Diego, CA*

JAN 2019

#### **Spatial Impact of a Multi-individual Grave on Soil Biochemistry and Microbial Ecology.**

AMERICAN SOCIETY OF MICROBIOLOGY (ASM)

*Atlanta, GA*

JUN 2018

## Collaborator Products

1. Lois Taylor, **Allison Mason**, Jennifer DeBruyn (FEB 2025). Seasonal Patterns of Fly-Associated *Ignatzschineria* in Human Decomposition- Impacted Soils. American Academy of Forensic Sciences (AAFS) Baltimore, MD
2. Charity G. Owings, Hayden S. McKee-Zech, Ryan Kuster, **Allison R. Mason**, Jack Orebaugh (NOV 2024). Gut Bacterial Diversity of *Chrysomya megacephala* (Fabricius) Entomological Society of America Pheonix, AZ
3. Hayden S McKee-Zech, Erin A. Patrick, **Allison R. Mason**, Katha Hoeland, Charity Owings, Sarah T Schwing, Thomas Delgado, Amanda May, Mary C. Davis, Jennifer Debruyn, Shawn Campagna, Dawnie W Steadman (AUG 2024). Field Data Collection Protocols for NIJ Grant The Impact of Drugs on Human Decomposition and the Postmortem Interval: Insect, Scavenger and Microbial Evidence.
4. Charity G. Owings, Hayden S. McKee-Zech, **Allison R. Mason**, Jack Orebaugh (NOV 2023). Blow Fly (Diptera: Calliphoridae) Gut Bacterial Diversity Entomological Society of America National Harbor, MD

5. Jack Orebaugh, Charity G. Owings, Hayden S. McKee-Zech, **Allison R. Mason** (NOV 2023). Creating a Reference Database for Blow Fly-Derived Bacterial Taxa Entomological Society of America National Harbor, MD
6. **Allison R. Mason**, Lois S. Taylor, Jennifer M. DeBruyn (NOV 2022). Metatranscriptomics Reveals Soil Microbial Functional Succession over One Year of Human Decomposition. ASA, CSSA, SSSA International Annual Meeting NA
7. Lois S. Taylor, **Allison R. Mason**, Jennifer M. DeBruyn (FEB 2022). Seasonal comparisons between soil fungal and bacterial communities impacted by human decomposition. American Academy of Forensic Sciences (AAFS) NA
8. Dawnie W. Steadman, Jennifer M. DeBruyn, Shawn R. Campagna, **Allison R. Mason**, Hayden S. McKee, Katharina M. Hoeland, Sarah T. Schwing, Erin A. Patrick, Mary C. Davis, Amanda L. May, Thomas A. Delgado (FEB 2021). The Impact of Drugs on Human Decomposition and the Postmortem Interval: Insect, Scavenger and Microbial Evidence. National Institute of Justice (NIJ) Forensic Science Research and Development Symposium Virtual
9. Lois S. Taylor, **Allison R. Mason**, Jennifer M. DeBruyn (FEB 2021). Seasonal Differences in Soil Fungal Community Successional Patterns Impacted by Long-term Human Decomposition. American Academy of Forensic Sciences (AAFS) Virtual
10. Katharina M. Hoeland, Amanda L. May, Hayden S. McKee, Mary C. Davis, Sarah T. Schwing, Thomas A. Delgado, Charity G. Owings, **Allison R. Mason**, Shawn R. Campagna, Jennifer M. DeBruyn, Dawnie W. Steadman, Russel L. Zaretski (FEB 2021). Expanding Frontiers in Postmortem Toxicology: Drug Tracing in Different Postmortem Matrices during Human Decomposition using Ultra-High-Performance Liquid Chromatography-High Resolution Mass Spectrometry (UHPLC-HRMS). American Academy of Forensic Sciences (AAFS) Virtual
11. Amanda L. May, Katharina M. Hoeland, Hayden S. McKee, **Allison R. Mason**, Sarah T. Schwing, Charity G. Owings, Thomas A. Delgado, Mary C. Davis, Russel L. Zaretski, Jennifer M. DeBruyn, Dawnie W. Steadman, Shawn R. Campagna (FEB 2021). Using Metabolomics to Gain a Deeper Understanding of Human Decomposition. American Academy of Forensic Sciences (AAFS) Virtual
12. Hayden S. McKee, Charity G. Owings, Katharina M. Hoeland, Liesel Schneider, **Allison R. Mason**, Kristi Bugajski, Shawn R. Campagna, Jennifer M. DeBruyn, Dawnie W. Steadman (NOV 2020). Prescription Drugs detected in humans post-mortem impact *Phormia regina* Meigen (Diptera: Calliphoridae) larval length. Entomological Society of America (ESA) 2020 Virtual
13. Victoria V. Beard, **Allison R. Mason**, Jennifer M. DeBruyn (APR 2020). Changes in Antibiotic Resistance of Soil Microbes During Human Decomposition. The Exhibition of Undergraduate Research and Creative Achievement (EURECA) University of Tennessee-Knoxville
14. Katharina M. Hoeland, Amanda L. May, Hayden S. McKee, Thomas A. Delgado, Sarah T. Schwing, **Allison R. Mason**, Shawn R. Campagna, Jennifer M. DeBruyn, Dawnie W. Steadman (FEB 2020). Utilizing Metabolomics Toward Time-Dependent Metabolite Monitoring in Different Postmortem Specimens during Human Decomposition. American Academy of Forensic Sciences (AAFS) Anaheim, CA
15. Lois S. Taylor, **Allison R. Mason**, Ernest C. Bernard, Mary C. Davis, Dawnie W. Steadman, Jennifer M. DeBruyn (FEB 2020). Seasonal Differences in Soil Chemistry and Biology Impacted by Long-term Human Decomposition. American Academy of Forensic Sciences (AAFS) Anaheim, CA
16. Lois S. Taylor, **Allison R. Mason**, Ernest C. Bernard, Jennifer M. DeBruyn (AUG 2019). Nematode successional patterns in soils impacted by human decomposition. Entomological Society of America (ESA) 2019 NA

## Awards

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### STAR Award for Performance

GEOLOGY ENERGY & MINERAL SCIENCE CENTER, U.S. GEOLOGICAL SURVEY

2025

### Graduate Student Senate Travel Award

THE UNIVERSITY OF TENNESSEE-KNOXVILLE

2022

### Graduate Student Senate Travel Award

THE UNIVERSITY OF TENNESSEE-KNOXVILLE

2019

### Outstanding Abstract Award

AMERICAN SOCIETY FOR MICROBIOLOGY

2018

### ASM Student and Postdoctoral Travel Award

AMERICAN SOCIETY FOR MICROBIOLOGY

2018

### Graduate Student Senate Travel Award

THE UNIVERSITY OF TENNESSEE-KNOXVILLE

2018

## Specialized Training

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<b>R in Production workshop at posit::conf</b> SEATTLE, WA	Aug 2024
<b>Software Carpentries Instructor Training</b> THE UNIVERSITY OF MICHIGAN	Nov 2023
<b>Introduction to Package Development workshop at posit::conf</b> CHICAGO, IL	Sep 2023
<b>Package Development Masterclass workshop at posit::conf</b> CHIGACO, IL	Sep 2023
<b>MICR606 Entering Mentoring</b> KNOXVILLE, TN	Jan 2022 - May 2022

<b>Service</b>	
<b>Instructor</b> SOFTWARE CARPENTRY	Nov 2023 - Present
<b>K-12 Science Outreach</b> U.S. GEOLOGICAL SURVEY	Nov 2024 - Feb 2025
<b>Member</b> U-M CARPENTRIES	Jan 2023 - Nov 2024
<b>Vice President</b> MICROBIOLOGY GRADUATE STUDENT ASSOCIATION	Aug 2019 - May 2021
<b>Symposium Judge</b> UNIVERSITY OF TENNESSEE EXHIBITION OF UNDERGRADUATE RESEARCH AND CREATIVE ACHIEVEMENT (EURECA)	Apr 2020, Apr 2019
<b>Instructor</b> UNIVERSITY OF TENNESSEE KIDSU FUN WITH FORENSICS, ADVENTURES IN CHEMISTRY	Jul 2019, Jul 2018
<b>Regional Judge</b> HEALTH OCCUPATIONS STUDENTS OF AMERICA (HOSA) OHIO REGIONAL	May 2017
<b>Symposium Judge</b> EASTLAND-FAIRFIELD BIOSCIENCE TECHNOLOGIES CAPSTONE SYMPOSIUM	Apr 2014