# MICHAEL J. SIELER JR.


**Summary**

· Microbiome scientist with 5+ years of experience developing molecular, computational, and statistical research methods

· Research how multiple environmental factors interact with the gut microbiome to influence host health

· Robust data analytic skills in multivariate statistics and machine learning to drive research experiments forward

· Demonstrated abilities to collaborate and take leadership in cross-laboratory experiments

· Experienced in written, oral and visual communication across scientific and public audiences


## EDUCATION

2020 | estimated 2025 *

***Ph.D. Microbiology, minor in Biological Data Sciences**
Oregon State University — Corvallis, Oregon

2017 | 2020

**B.Sc. Bioresource Research, options in Bioinformatics and Genomics**
Oregon State University — Corvallis, Oregon

## WORK EXPERIENCE

May 2022 | Present

**Owner**
MJSieler Consulting — Corvallis, Oregon
Activities: *Designed, developed, and deployed educational video game software for clients to fulfill grant requirements for communicating scientific research.*

Projects: *Virtual Fish*

Sep. 2020 | Present

**Graduate Research Student**
Sharpton Lab (Oregon State University) — Corvallis, Oregon
Activities: *Investigate how environmental factors (diet, pollutants, pathogens, etc.) interact with the gut microbiome to influence host health using the zebrafish model organism.*

Projects: *Impacts of diet & infection, temperature & infection, and chronic antibiotic exposure on gut microbiome*

Nov. 2018 | Sep. 2020

**Undergraduate Research Student**
Sharpton Lab (Oregon State University) — Corvallis, Oregon
Activities: *Developed novel gnotobiotic microbiome methods using zebrafish.*

Projects: *Benzo[a]pyrene effect on zebrafish gut microbiome*

Nov. 2017 | Nov. 2018

**Undergraduate Research Student**
Mahmud Laboratory (Oregon State University) — Corvallis, Oregon
Activities: *Assist PhD students and Post-docs with research projects.*

Projects: *Discovering novel antibiotics*

## CONTACT INFO


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## SKILLS

*Programming:* R, Python, Markdown, C#/Unity, Git, bash/shell, SQL, HTML, CSS, C++ and LaTeX
*Analysis:* Advanced applied statistics, Multivariate linear regression, Machine learning and Model building and selection
*Bioinformatics:* 16S sequencing, Phyloseq, DADA2, Metagenomics, Mothur, HMMER and FastTree
*Lab:* zebrafish husbandry, Bacterial culturing, DNA extraction, PCR amplification and Gel electrophoresis
*Other:* Microsoft Office Suite, Adobe Photoshop and Illustrator and Blender
*Language:* English, German (C1) and Spanish (A2)

*Last updated on 2022-08-08.*

## RESEARCH EXPERIENCE

**Measure the effect of nanoplastics on the mouse gut microbial community**
Statistically analyzed nanoplastic exposure on mouse gut microbial communities
Tools: *R, DADA2*
*Szule (2022)*

**Meta-analysis of zebrafish gut microbiomes phylogeny**
Identified relevant studies and datasets to include in meta-analysis
Tools: *Python, R, DADA2*
*Sharpton (2021)*

**Built and maintain Microbial Bioinformatics Hub to collaboratively share microbiome bioinformatic resources**
Website for sharing knowledge, methods and tools related to analyzing microbiological data
Tools: *GitLab, Sphinx and Read the Docs*
*MicrobialBioinformaticsHub*

**Developed high-throughput molecular biological and computational pipelines to interrogate gut microbiome**
Designed and implemented novel gnotobiotic procedures to process 1,000+ zebrafish embryos to analyze their microbiomes
Tools: *R, DADA2*
*Stagaman (in-development)*

**Measure resilience of gut microbiome to chronic exposure of antibiotics**
Exposed 140 adult zebrafish to varying combinations of antibiotics and controls
Tools: *R, DADA2*
*Sieler (in-development)*

**Assess gut microbiome resiliency to anthropological impacts such as temperature and pathogenic exposure**
Exposed adult zebrafish to varying combinations of antibiotics and controls
Tools: *R, DADA2*
*Sieler (in-development)*

**Investigate the joint interaction effects of pathogen exposure and diet on gut microbiome succession**
Fed 180 zebrafish one of three commonly used laboratory diets and exposed half to a common pathogen
Tools: *R, DADA2*
*Sieler (in-development)*

## AWARDS (2)

2020 | Present

**Science Communication Fellow**
Oregon Museum of Science and Industry (OMSI) — Portland, Oregon
Recognized for my early significant contributions to scientific research, I was awarded the prestigious ARCS Scholar grant
*ARCSFoundation.org*

2020 | 2023

**ARCS Scholar**
ARCS Foundation — Corvallis, Oregon
Received certified training in informal science education and engagement with public audiences to increase their understanding of STEM research
*OMSI.edu*

## CERTIFICATES (1)

2021

**Data Science and Machine Learning Bootcamp with R**
Udemy
Program with R to wrangle, clean, analyze, and visualize data. Apply advanced statistics and machine learning to gain useful insights.

*Certificate*

## ORAL COMMUNICATIONS (2)

2021

**Zebrafish laboratory diets differentially alter gut microbiota composition**
3rd Intl. Fish Microbiota Workshop *Chinese Academy of Agriculture Sciences*
Online (Beijing, China)

*MichaelSieler.com*

2022

**Effects of diet on growth and the microbiome**
Zebrafish Husbandry Workshop
*Aquaculture*
Online (San Diego, CA)

*MichaelSieler.com*

## POSTER COMMUNICATIONS (2)

2019

**The Gut Microbiome Drives Benzo[a]pyrene's Impact on Zebrafish Behavioral Development**
CAS Student Showcase *Oregon State University*
Corvallis, Oregon

2019

**The Gut Microbiome Drives Benzo[a]pyrene's Impact on Zebrafish Behavioral Development**
2nd Intl. Fish Microbiota Workshop *University of Oregon*
Eugene, Oregon

## PUBLICATIONS (3)

Jul. 2022

**Early Enteric and Hepatic Responses to Ingestion of Polystyrene Nanospheres from Water in C57BL/6 Mice**
Joseph A. Szule, Lawrence R. Curtis, Thomas J. Sharpton, Christiane V. Löhr, Susanne Brander, Stacey Harper, Jamie Pennington, Sara J. Hutton, Michael J. Sieler Jr. and Kristin D. Kasschau

*Frontiers in Water*

Feb. 2022

**Revealing General Patterns of Microbiomes That Transcend Systems: Potential and Challenges of Deep Transfer Learning**
Maude M. David, Christine Tataru, Quintin Pope, Lydia J. Baker, Mary K. English, Hannah E. Epstein, Austin Hammer, Michael Kent, Michael J. Sieler Jr., Ryan S. Mueller, Thomas J. Sharpton, Fiona Tomas, Rebecca Vega Thurber and Xiaoli Z. Fern

*mSystems*

Jan. 2021

**Phylogenetic Integration Reveals the Zebrafish Core Microbiome and Its Sensitivity to Environmental Exposures**
Thomas J. Sharpton, Keaton Stagaman, Michael J. Sieler Jr., Holly K. Arnold and Edward W. Davis

*Toxics*