# Michael Sieler

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## Summary


- Microbiome scientist with 5+ years of experience developing high-throughput molecular, computational and statistical methods and experiments to understand how environmental factors impact the gut microbiome to influence host health.
- Robust data analytic skills in multivariate statistics and machine learning propel research experiments forward and gain data-driven insights
- Demonstrated abilities to collaborate and lead cross-laboratory experiments and extra-curricular projects
- Experienced in written, oral and visual communication across scientific and public audiences


## WORK EXPERIENCE

**Oregon State University** **Sept. 2020 – Present**
*Graduate Research Assistant* *Corvallis, OR*

- Contribute to 8+ quantitative research projects by statistically analyzing 1000's of microbiome samples
  - Publish research findings in 3 peer-reviewed papers, 4 talks & posters at international conferences
- Conduct laboratory experiments and statistical pipelines in R and Python to advance data-driven research goals
- Demonstrate leadership by coordinating cross-laboratory scientific experiments with 10+ researchers

**Oregon State University** **Nov. 2017 – Sept. 2020**
*Undergraduate Student Researcher* *Corvallis, OR*

- Develop novel research methods to analyze 1000's of zebrafish embryos for gut microbiome experiments
- Assist Ph.D. students and post docs research projects by identifying 10+ putative antibiotic compounds

## TEACHING EXPERIENCE

**Oregon State University: Lab Teaching Assistant** **2022**
*General Microbiology Lab, MB 303* *Corvallis, OR*

- Graded lab notebooks, homework assignments and exams
- Taught students aseptic technique, gram stains and T-streaking
- Assisted instructor in class prep/set-up/clean-up, and exam proctoring

**Oregon State University: Lab Teaching Assistant (virtual)** **2021**
*Introduction to Microbiology Lab, MB 230* *Corvallis, OR*

- Led weekly lab lecture
- Graded student homework assignments

## EDUCATION

**Oregon State University** **Expected June, 2025**
*Ph.D. Microbiology, minor: Biological Data Sciences. GPA: 3.95* *Corvallis, OR*

**Oregon State University** **June, 2020**
*B.Sc. Bioresource Research, options: bioinformatics and genomics. GPA: 3.82* *Corvallis, OR*
• Thesis: "The Gut Microbiome Drives Benzo[a]pyrene's Impact on Zebrafish Behavioral Development"

## RESEARCH PROJECTS

- Measure resilience of gut microbiome to anthropogenic impacts (e.g., antibiotics, climate change)
- Investigate the multivariate interaction effects of diet and pathogen exposure on gut microbiome succession
- Assess the effect of nanoplastics on the mouse gut microbial community
- Potential and challenges of deep transfer learning in microbiome science
- Meta-analysis of environmental exposure impact to zebrafish core gut microbiome phylogeny
- The environmental pollutant Benzo(a)Pyrene influences gut microbiome and neurobehavior in juvenile zebrafish

## SIDE PROJECTS

Virtual Fish – Browser based educational video game to share scientific research to students

- Fulfill USDA grant deliverables to communicate scientific research to broader audiences
- Tools used: C#, Unity, Git

Spotify Genre Visualization – Interactive R Shiny app to explore metadata in a 100,000+ Spotify song database

- Tools used: R, R-shiny, Kaggle

Microbial Bioinformatics Hub – Open-source site to share bioinformatic research knowledge, methods & tools

- Tools used: Sphinx/ReadTheDocs, HTML/CSS, Git

## COURSEWORK

- Genetics
- Microbial Genetics
- Methods of Data Analysis I, II, & III
- Applied Statistics
- Applied Bioinformatics
- Microbial Bioinformatics
- Analytical Workflows
- Command Line Data Analysis
- Data Visualization
- Intro Computer Science I & II
- Programming & Data Structures
- Python I & II
- Statistical Programming in R
- Intro Unix/Linux

## SKILLS

**Programming:** R, Python (OOP, Numpy, TensorFlow), C# (Unity), Git, Unix/Linux, SQL, command line tools, HTML, CSS, C++, LaTeX, Markdown, APIs, JSON
**Analysis:** hypothesis testing, multivariate linear regression, machine learning, model building and testing, big data query, data management, data visualization
**Bioinformatics:** 16S sequencing (Phyloseq, DADA2), metagenomics (HMMR, FastTree), genomic (BLAST, NCBI, NGS),
**Laboratory**: Zebrafish husbandry, bacterial culturing, DNA extraction, PCR, gel electrophoresis, aseptic technique
**Other**: Microsoft Office Suite, Adobe Photoshop & Illustrator
**Languages**: German (C1), Spanish

## PUBLICATIONS

Joseph A. Szule, …, **Michael J. Sieler Jr.** (2022). "Early Enteric and Hepatic Responses to Ingestion of Polystyrene Nanospheres from Water in C57BL/6 Mice." *Front. Water.*

David, Maude M., …, **Michael J. Sieler Jr.** (2022). "Revealing General Patterns of Microbiomes That Transcend Systems: Potential and Challenges of Deep Transfer Learning." *Msystems.*

Sharpton, Thomas J., …, **Michael J. Sieler Jr.** (2021). "Phylogenetic integration reveals the zebrafish core microbiome and its sensitivity to environmental exposures." *Toxics.*

## PRESENTATIONS

**Zebrafish Husbandry Workshop** **2022**
*Aquaculture* *San Diego, CA*
"Effects of diet on growth and the microbiome"

**3rd International Fish Microbiota Workshop** **2022**
*Chinese Academy of Agriculture Sciences* *Beijing, China (Virtual)*
"Zebrafish laboratory diets differentially alter gut microbiota composition"

## POSTERS

**2nd International Fish Microbiota Workshop** **2019**
*University of Oregon* *Eugene, OR*
"The Gut Microbiome Drives Benzo[a]pyrene's Impact on Zebrafish Behavioral Development"

**College of Agriculture Science Showcase** **2019**
*Oregon State University* *Corvallis, OR*
"The Gut Microbiome Drives Benzo[a]pyrene's Impact on Zebrafish Behavioral Development"

## FELLOWSHIPS & AWARDS

**Science Communication Fellow** **2020-Present**
*Oregon Museum of Science and Industry*
Received certified training in informal science education and engagement with public audiences to increase their understanding of STEM research

**ARCS Scholar** **2020**
*ARCS Foundation*
Recognized for my early significant contributions to scientific research

## LEADERSHIP

**Microbiology Graduate Student Association** **2022-2023**
*Oregon State University* *Corvallis, OR*
President

## CERTIFICATES

**Data Science and Machine Learning with R** **2021**
*Udemy* *Certificate of completion*

## REFERENCES

**Thomas J Sharpton, Ph.D.** — Ph.D. advisor
*Oregon State University* — *Corvallis, OR*
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**Stephen Atkinson, Ph.D.** — Project collaborator
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