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

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

Spotify Genre Viz – 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"

HONORS & 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

REFERENCES

Thomas J Sharpton, Ph.D. Ph.D. Advisor

Oregon State University *Corvallis, OR*

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