**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
  + Published 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*

* Class size 70 students, 5 hrs/wk

**Oregon State University: Class Teaching Assistant (virtual) 2021**

*Human Microbiome, MB 436 Corvallis, OR*

* Class size 30 students, 2 hrs/wk

**Oregon State University: Lab Teaching Assistant (virtual) 2021**

*Introduction to Microbiology Lab, MB 230 Corvallis, OR*

* Class size 60 students, 4 hrs/wk

**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**

Sim 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
* Website: github.com/OSU-Edu-Games/Sim-Fish

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

* Tools used: R, R-shiny, Kaggle
* Website: michael-sieler.shinyapps.io/Spotify\_heatmap/

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

* Tools used: Sphinx/ReadTheDocs, HTML/CSS, Git
* Website: microbial-bioinformatics-hub.readthedocs.io/

**COURSEWORK**

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| --- | --- | --- |
| • 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

**Analysis:** hypothesis testing, multivariate linear regression, machine learning, model building and testing, big data query (APIs, JSON), data management, data visualization (R shiny)

**Bioinformatics:** 16S sequencing (Phyloseq, DADA2), metagenomics (HMMR, FastTree), genomic (BLAST, NCBI)

**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 (virtual)*

“Effects of diet on growth and the microbiome”

**3rd International Fish Microbiota Workshop**  **2021**  
*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 – 2023**

*ARCS Foundation*

Recognized for my early significant contributions to scientific research

**LEADERSHIP**

**Microbiology Graduate Student Association 2022 – Present**

President

*Oregon State University Corvallis, OR*

**CERTIFICATES**

**Data Science and Machine Learning with R 2021**

*Udemy*

**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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**Katharine Field, Ph.D.** Undergraduate advisor & program director

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