

# Alexis Porter

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## EDUCATION

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### Master of Public Health in Epidemiology

May 2021

Grand Valley State University School of Interdisciplinary Health

*Project Title:* “SARS-CoV-2 Wastewater Surveillance: An Epidemiological Analysis of COVID-19”

*Advisors:* Azizur Molla, Ph.D., Richard R. Rediske, Ph.D.

### Bachelor of Science in Biomedical Sciences

Grand Valley State University, Allendale, MI

May 2017

*Undergraduate research:* Pathogenic mechanisms of *Salmonella* and *Escherichia coli*

## RESEARCH INTERESTS

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Evaluation of exposure, risk, and surveillance associated with environmental health and contaminants utilizing epidemiologic and geospatial models. Investigation focused on microbial and dynamic features of infectious disease inclusive of social-behavioral and biological determinants of emergence, transmission, pathogenesis, and immunity within a population.

## RESEARCH EXPERIENCE

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### Adjunct Research Assistant

*Annis Water Resources Institute, Grand Valley State University*

*Lead Analyst and Public Health Coordinator for SARS CoV-2 Wastewater Monitoring-* Execute SARS-CoV-2 RNA wastewater sample processing inclusive of sample reception, logging, NaCl and PEG concentration, RNA extraction, and sample storage. Analyze RNA extracts using ddPCR methods for SARS-CoV-2 N1/N2 gene markers along with Phi6 phage analysis for inhibitory reporting. Results are then analyzed for variant analysis discrimination assays to identify mutations on spike proteins, N genes, and M genes affiliated with variants of concern. Communicate with local public health departments, MDHHS, and EGLE to offer insight into current COVID-19 prevalence in local communities through data analysis and visualizations.

*Beach Monitoring Coordinator-* Train and supervise technicians sampling 34 beaches and oversee the *E. coli* testing with Colilert and qPCR in addition to the preparation of sanitary surveys. Report data to local health departments and the State of Michigan. Collaborate in identification of potential Harmful Algal Blooms and potential agent corresponding to bloom. Provide support for beach advisories due to elevated bacterial levels and Harmful Algal Blooms with local and state partners.

*Water Quality Laboratory Analyst-* Conduct laboratory analyses for nutrients using wet chemistry, ion chromatography, and segmented flow methods utilizing SEAL Analytical AQ400 and AQ2,

inclusive of preparation of necessary laboratory reagents and buffers. Partner with laboratory supervisor to assess inventory, budgeting, and staffing schedules to oversee workflow for all grant and contracted projects.

### **Undergraduate Research Technician**

*Department of Biomedical Sciences, Grand Valley State University*

*Research technician-* Investigate genes key in *E. coli* biofilm formation under conditions mirroring natural environment. Identify regulator genes in *E. coli* responsible for increasing or decreasing biofilm response to oxygen by simulating aerobic, microaerophilic, and anaerobic conditions. Utilize transposon mutagenesis to create randomized mutations within the chromosome that can be characterized under biofilm assay.

Identify and analyze regulatory genes key to Salmonella pathogenesis under Pathogenicity Islands 1 and 2 (SPI-1, SPI-2) noted in affiliation to repressor gene hile. Identification of hile repressor allows for work with creating polar mutations in reading frames to assess effects these mutations have on Salmonella virulence utilizing gene reporter, cell invasion, macrophage survival, bacterial adherence, and cell motility assays under various inducing and noninducing environmental conditions.

### **MENTORING EXPERIENCE**

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#### **Adjunct Research Assistant**

*Annis Water Resources Institute, Grand Valley State University*

- Assist in training and supervision of undergraduate students in learning various laboratory technical skills, scientific writing, and presentation preparation
- Plan and lead field work with students teaching in field collection strategies and collection site planning based on project goals and needs

#### **Public Health Graduate Mentor**

*School of Interdisciplinary Health, Grand Valley State University*

- Mentor new cohort of public health graduate students on epidemiological insights
- Work as alumni to assist in offering practicum site placements for public health students

### **TECHNICAL SKILLS**

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- NaCl and PEG precipitation and viral RNA concentration
- Viral RNA extraction
- Advanced PCR methods using qPCR and ddPCR
- Culture based methods
- Field sampling and survey assessment
- Segmented and discrete flow methods, flow cytometry
- Nutrient analysis and wet lab chemistry
- Buffer and reagent preparation
- Microbial risk assessments
- Statistical software: SAS, R, RStudio, Python
- Use of visual software Tableau
- Geospatial software ArcGIS and QGIS
- Advanced knowledge of general laboratory processes and aseptic techniques
- Data organization, analysis, processing, and reporting to various partners

## PUBLICATIONS

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D'Souza N., **Porter A.**, Rose J.B., Carbonell S., Nowlin P., Cissel K., Dreelin E., Flood M., Peters S., Rachmadi A., Song P., Wang Y., Xi C., Briggs S. and the Michigan Network for Environmental Health and Technology (MiNET) Consortium. (2022). Public Health Use and Lessons Learned for a State-wide SARS-CoV-2 Wastewater Surveillance Program (MiNET). *Environmental Health Perspectives*. Forthcoming.

James N. McNair, Molly J. Lane, John J. Hart, **Alexis M. Porter**, Shannon Briggs, Benjamin Southwell, Tami Sivy, David C. Szlag, Brian T. Scull, Schuyler Pike, Erin Dreelin, Chris Vernier, Bonnie Carter, Josh Sharp, Penny Nowlin, Richard R. Rediske. (2022). Validity Assessment of Michigan's Proposed qPCR Threshold Value for Rapid Water-Quality Monitoring of *E. coli* Contamination. *Water Research*. doi: <https://doi.org/10.1101/2022.07.16.500300>. Forthcoming.

## CONFERENCES

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### Oral Presentations

**Porter, A.** Richard Rediske. (2022). *SARS-CoV-2 Variant Analysis Utilizing Wastewater-Based Epidemiology: A Comparison of Wastewater and Clinical Case Data in West Michigan from 2021-2022*. APHA 2022 Annual Meeting and Expo. Boston, Massachusetts. November 2022. Forthcoming.

**Porter, A.**, Richard Rediske. (2022). *West Michigan Validity Assessment for qPCR Threshold Value Utilized in Beach Water-Quality Monitoring of E. coli Contamination: A Six-Year Review and Application of Beach Closure Decision Matrix Utility*. Michigan Network for Environmental Health and Technology Annual Meeting. Muskegon, Michigan. October 2022. Forthcoming.

**Porter, A.** (2022). *Beach Monitoring: Surveillance of Michigan Beaches and E. coli Detection Methodology*. Michigan Lakes and Streams Annual Conference. Thompsonville, Michigan. May 2022.

**Alexis Porter**, Azizur Molla, Richard Rediske. (2021). *SARS-CoV-2 Wastewater Surveillance: An Infectious Epidemiological Analysis of COVID-19*. APHA 2021 Annual Meeting and Expo-Student Engagement Theater. Denver, Colorado. November 2021.

**Alexis Porter**, Richard Rediske, Azizur Molla. (2021). *SARS-CoV-2 Wastewater Surveillance: An Epidemiological Analysis of Population Surveillance in west Michigan*. Michigan Network for Environmental Health and Technology Annual Meeting. Muskegon, Michigan. October 2021.

### Poster Presentations

**Alexis Porter**, Azizur Molla, Richard Rediske. (2021). *SARS-CoV-2 Wastewater Surveillance: An Infectious Epidemiological Analysis of COVID-19*. APHA 2021 Annual Meeting and Expo. Denver, Colorado. November 2021.

**Alexis Porter**, Azizur Molla, Richard Rediske. (2021). *SARS-CoV-2 Wastewater Surveillance: An Infectious Epidemiological Analysis of COVID-19*. Grand Valley State University Graduate Showcase. Grand Rapids, Michigan. April 2021.

**Alexis Porter**, Richard Rediske. (2021). *Investigation of Escherichia coli Contamination in Pigeon River Watershed*. Michigan Academy of Science, Arts, and Letters Conference. Virtual. March 2021.

Gordon, R., **A. Porter**, S. Xu, J. Zhou, A. Pickrum, M.A. Baxter. (2017). *Biofilm Growth Under Aerobic and Microaerophilic Conditions*. Student Scholarship Day 2017, GVSU, Allendale, Michigan. April 2017.

## CERTIFICATIONS AND AWARDS

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Grand Valley Presidential Award for Recognition in COVID-19 Pilot Study for the State of Michigan	2021
"I am GV" Leadership Award	2021
Adult and Pediatric First Aid/CPR/AED	2021-2022
Association of State and Territorial Health Officials: Making Contact COVID-19 Contact Tracers	2020
CITI Training-Biomedical and Social-Behavioral Responsible Conduct of Research	2019
Bystander Intervention Training	2019
University of Michigan-Human Trafficking, Prevention, and Advocacy	2019

## LANGUAGES

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- English: Fluent
- Spanish: Proficient
- Japanese: Beginner-Ongoing education

## PROFESSIONAL MEMBERSHIPS

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- American Public Health Association (APHA)
- Michigan Lakes and Streams Association (MLSA)
- GVSU Public Health Society (GVPHS)
- Michigan Network for Environmental Health and Technology (MiNET)

## REFERENCES

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### **Richard R. Rediske, Ph.D., Distinguished Research Fellow**

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(616) 331-3047, [redisker@gvsu.edu](mailto:redisker@gvsu.edu)

### **Brian T. Scull, Research Laboratory Supervisor**

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### **Azizur Molla, Ph.D., M.P.H., Professor**

Master of Public Health Program, School of Interdisciplinary Health  
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### **Karen Niemchick, Ph.D., M.H.S., Assistant Professor, Practicum Coordinator**

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### **Charlyn Partridge, Ph.D., Associate Professor**

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