

MICHELLE VALKANAS

EDUCATION

- 2016 to present Ph.D. Candidate in Biology, Duquesne University, Pittsburgh, PA
- 2014 Bachelor of Science in Biology, Minor in Mathematics, Duquesne University, Pittsburgh, PA

PUBLICATIONS

Valkanas, M.M. and Trun, N.J. (2018) A seasonal study of a passive abandoned coalmine drainage remediation system reveals three distinct zones of contaminant levels and microbial communities. *MicrobiologyOpen*. 2018:e585. <https://doi.org/10.1002/mbo3.585>

Truc Ly, Justin R. Wright, Nicholas Weit, Christopher J. McLimans, Nikea Ulrich, **Michelle M. Valkanas**, Nancy Trun, Shawn Rummel, Christopher J. Grant, Regina Lamendella. (2019) Microbial Communities Associated with Passive Acidic Abandoned Coal Mine Remediation. *Frontiers in Microbiology*. (**In Press**).

M.M. Valkanas, A. Michalski, and N. J. Trun. The reproducibility of bacterial community composition in environmental samples collected over geographical distances. (**In Preparation**).

SCHOLARLY PRESENTATIONS AT NATIONAL AND REGIONAL MEETINGS

Oral Presentations

- 2018 *Student Symposium on the Environment* (December, Westminster College)
- Oral presentation discussing the negative impacts naturally forming communities have on passive remediation systems built to treat AMD: *The Impacts of Naturally Forming Microbial Communities Found in Passive Remediation Systems*
- 2018 *ABASM Meeting* (November, Gettysburg College, Gettysburg, PA)
- **Awarded first place** for my oral presentation discussing the impact naturally forming microbial communities have on passive remediation systems: *Characterization of Microbial Communities in Passive Remediation Systems Designed to Treat Abandoned Mine Drainage*
- 2017 *ABASM Meeting* (November, Juniata College, Huntingdon, PA)
- Oral presentation discussing the in vitro system developed to study microbial communities in passive remediation systems: *An in vitro system to study the microbial impacts on a passive remediation system*
- 2016 *ABASM Meeting* (November, Penn State Behrend, Erie, PA)
- Oral presentation on completed study of the seasonal effects on a passive coalmine

remediation: *A seasonal comparison of a passive abandoned coal mine remediation system*

Poster Presentations

2018 American Society of Mining and Reclamation Annual Conference (June, St. Louis, MO)

- **Awarded first place** for my presentation on a lab-based system to study microbial communities in passive remediation systems: *Lab-Based System to Study the Microbial Impacts on Passive Remediation Systems Built to Treat AMD*

2018 Graduate Research Symposium (March, Duquesne University, Pittsburgh, PA)

- Presented a lab-based system to study microbial communities found in passive systems: *Lab-Based System to Study the Microbial Impacts on Passive Remediation Systems Built to Treat AMD*

2018 Pittsburgh Bacterial Meeting (March, Duquesne University, Pittsburgh, PA)

- Presented a lab-based system to study microbial communities found in passive systems: *Lab-Based System to Study the Microbial Impacts on Passive Remediation Systems Built to Treat AMD*

2017 Task Force-ASMR-ARRI Conference (April, Morgantown, WV)

- **Awarded third place** for presentation on research identifying the seasonal impacts on geochemical and biological factors in AMD passive remediation systems: *A seasonal comparison of the passive abandoned coal mine remediation at Wingfield Pines*

2017 Northeast/Northcentral Geological Society of America (March, Pittsburgh, Pennsylvania)

- Presented the completed seasonal study on changes in passive remediation system efficiencies due to the change in seasons: *A seasonal comparison of the passive abandoned coal mine remediation at Wingfield Pines*

2017 Graduate Research Symposium (March, Duquesne University, Pittsburgh, PA)

- Presented the completed seasonal study on changes in passive remediation system efficiencies due to seasonal changes: *A seasonal comparison of the passive abandoned coal mine remediation at Wingfield Pines*

2016 Metals Symposium (September, Duquesne University, Pittsburgh, PA)

- Poster presentation of current research on AMD and the effects weather change has on a passive remediation site: *A seasonal comparison of the passive abandoned coal mine remediation at Wingfield Pines*

2015 ABASM Meeting (November, University of Pittsburgh, Greensburg, PA)

- **Awarded first place** for presentation on current research involving AMD and the effects weather change has on a passive remediation system: *A seasonal comparison of the passive abandoned coal mine remediation system at Wingfield Pines*

COMMUNITY PRESENTATIONS

Invited Talks

2019 *International P.E.O. Sisterhood Local Chapter F* (February, Pittsburgh, PA)

- Invited to give a talk to the local chapter of P.E.O. Sisterhood to explain my research, because of their support and nomination for a PSA Scholar Award.

2018 *Conservation Week at Phipps Conservatory* (July, Pittsburgh, PA)

- Gave a talk to a summer camp (ages 10-13) at Phipps Conservatory on water quality and bioremediation, highlighting my research and the work of other local individuals doing conservation work in the Pittsburgh area: *Bioremediation: Using Bacteria to Clean Our Streams*.

DEPARTMENTAL PRESENTATIONS

Oral Presentation

2018 *Work in Progress (WIP)* (October, Pittsburgh, PA)

- Presented an update on my research to the Biological Sciences Department at Duquesne University, discussing the results of in vitro studies that looked at the biotic influences found in passive remediation systems: *Identifying the Role Bacteria Play in Passive Remediation Systems*

2018 *Department of Biological Sciences Retreat* (August, Pymatuning, PA)

- Presented a data blitz, *The Impacts Microbial Communities have on Passive Remediation Systems*, at the departmental retreat sharing my current research findings on passive remediation systems treating acidic and circum-neutral discharge

2018 *Department of Biological Sciences Seminar* (February, Pittsburgh, PA)

- Presented a data blitz, *Microbial Communities in Passive Remediation Systems*, at the departmental seminar to showcase the research that Dr. Nancy Trun's lab is doing

2017 *Department of Biological Sciences Retreat* (August, Pymatuning, PA)

- Presented a data blitz, *Microbes at Wingfield Pines*, at the departmental retreat discussing the first year of my dissertation research

Poster Presentations

2018 *Department of Biological Sciences Retreat* (August, Pymatuning, PA)

- Presented a lab-based system to study microbial communities found in passive systems: *A Lab-Based System to Study the Microbial Impacts on Passive Remediation Systems Built to Treat AMD*

2017 *Department of Biological Sciences Retreat* (August, Pymatuning, PA)

- Presented the completed seasonal study on changes in passive remediation system efficiencies due to seasonal changes: *A seasonal comparison of the passive abandoned coal mine remediation at Wingfield Pines*

PEER REVIEWED BLOG

Michelle Valkanas (2017). *From Flicker to Fire: novel research program leads to increase retention in STEM and exciting discoveries in prophage-mediated defense strategies* on Dr. Graham Hatfull from the University of Pittsburgh. Duquesne University, Pittsburgh, PA.
www.duq.edu/bioblog

AWARDED GRANTS

2019 National Center for Science Education Science Outreach Fellowship (\$9000)
2018 Allegheny Branch of American Society for Microbiology Travel Award (\$100)
2018 American Society of Mine and Reclamation Travel Award (\$250)
2017 Geological Society of America, Graduate Student Research Grant (\$1325)

AWARDS

2018 Graduate Student Award for Excellence in Teaching Nominee

TEACHING EXPERIENCE

August 2016 – Present *Teaching Assistant*

Duquesne University

- Super Lab IV: Microbiology, Spring 2017, Spring 2018
 - Responsible for 16 students in a novel research setting
 - The lab taught the skills of classic microbiology, as well as molecular work involving sequencing and primer design
 - Help students develop independent projects involving bioremediation
- Super Lab I: Experimental Biology, Fall 2017, Fall 2018
 - Responsible for 12 students in an experimental biology setting
 - The lab consisted of three modules that focused on microbiology, DNA extraction and sequencing, and protein expression and extraction
- Life Processes lab, Fall 2016
 - Responsible for two sections of 32 students in a general biology lab setting
 - Teaches the basic skills needed in biology such as using microscopes, pipettes, and scientific writing skills

RESEARCH AND WORK EXPERIENCE

August 2016 - Present

Graduate Research Assistant

Duquesne University, Dept. Biological Sciences, Dr. Nancy Trun, PI

- Continued work on Passive remediation system using classic microbiology, molecular biology, and biotechnology to identify the microbial communities in a passive remediation system.
- 16S rRNA sequencing to identify microbial composition and analyzed using python, Qiime, and R studio
- Geochemical cycling with emphasis on iron and sulfur cycles

August 2014 – August 2016

Researcher

Duquesne University, Dept. Biological Sciences, Dr. Nancy Trun

- Created and tested protocols for isolating high molecular weight DNA from soil samples

- 16S rRNA sequencing to identify microbial composition
- Next-generation sequencing analyzed using python, Qiime, and R studio

February 2015 – August 2016

Lab Technician

RJ Lee Group, Monroeville, PA

- Perform sample digestion by way of acid, water leach, or microwave in order for it to be analyzed by ion chromatography (IC), inductively coupled plasma atomic emission spectroscopy (ICP-AES), inductively coupled plasma mass spectrometry (ICP-MS), and flame atomic absorption (FLAA)
- Prepare mercury samples through digestion and analyze the samples using cold vapor atomic absorption spectroscopy (CVAA)
- Use LIMS (laboratory information management system) to batch, analyze, and peer review samples

August 2013 – May 2014

Chemical Analyst Intern

CWM Environmental, Kittanning, PA

- Analytical testing of water samples testing Biochemical Oxygen Demand, Total Suspended Solids, Total Dissolved Solids, Percent Solids, pH, Alkalinity, Acidity, and Specific Conductance.

COMMUNITY SERVICE AND OUTREACH

Museum on the Move

July 2018-Present

Carnegie Museum of Natural History

Children's Hospital of Pittsburgh

- Monthly visit Children's hospital providing bedside interaction with children. Bring specimens from the Carnegie Museum of Natural History, including dinosaur bone replicates, geological rocks, insect specimens, and Inuit artifacts to the children to interact with and learn from.

SIGMA Mentor

June 2017- Present

Citizens Science Lab

Pittsburgh, PA

- A week-long camp every June at the Citizens Science Lab in Pittsburgh, PA that provides high school students the opportunity to participate in hands-on science experiments. The program seeks to provide hands-on science for students normally not exposed to such opportunities in their high schools, while working one-on-one with a graduate mentor; the program also offers scholarships and intern opportunities to qualified students.

Ringgold North Elementary School STEM Outreach

November, 2018

Women in Science at Duquesne University

- Through Women in Science, I participated in a STEM outreach program at Ringgold North Elementary. Organized 3 biology activities for 86 fourth graders, including DNA Candy, Monsters Genetics, and Hand Washing Challenge. The event was led by women scientists, providing strong role models for the students.

West Greene High School Field Trip to Maiden Mine

November, 2018

Women in Science at Duquesne University

West Greene, PA

- Through Women in Science, I organized and facilitated a field trip for 30 high school students from West Greene High School to visit Maiden Mine, a passive remediation system built to treat abandoned coalmine drainage. The students first had a classroom component where members of Women in Science taught the students about bioremediation through a series of demonstrations and a lecture. The students then visited the site where they got a guided tour by the site manager from Stream Restoration Incorporated.

Meet a Scientist

May, 2018

Phipps Conservatory

Pittsburgh, PA

- A science communication event where I presented information about abandoned mine drainage and bioremediation by using the bacteria that are already present in a system. Also, provided demonstrations and information on how to get involved.

DNA-tastic: Women in Science

April, 2018

Pittsburgh Science and Technology Academy

Pittsburgh, PA

- Women in Science of Duquesne University did an outreach program for middle school girls at a local school in Pittsburgh. The workshop was themed around DNA and 4 stations were designed for the girls (grade 6-9) to rotate through where they learned about the structure of DNA, genetics, microscopy, and genotyping. This workshop was designed to teach the students science, all the while setting an example of women in science in all stages of their careers.

SPEAK UP: Women in Science

April, 2017

Duquesne University

Pittsburgh, PA

- A workshop designed for inner-city, young girls (ages 7-12) to promote confidence and negotiation skills. The program seeks to develop the necessary skills to negotiate successfully in a variety of conflicts children and young adults may encounter.

PROFFESIONAL SERVICE

GSOBS First Year Mentor Program

August 2018-Present

- Participate in the Graduate Students of Biological Sciences (GSOBS) Mentor Program where an elder PhD student is assigned to a first-year PhD to serve as a mentor during their first year. The program allows the entering students to have a point person to go to for guidance and advice throughout their first year.

Experienced Teaching Assistant during TA Orientation

August, 2018

Videotaping Session

- Served as an experienced teaching assistant during TA orientation week. It was during this time I provided tips and suggestions on effective teaching, as well as video recorded a session where the new TAs taught a pre-lab. Feedback was then provided on their videotaped sessions.

Center for Teaching Excellence Information session

- Was invited to talk as an experienced TA at the Center for Teaching Excellence (CTE) information session to share how I have taken advantage of the many services that CTE offers, including receiving my certificate in University Teaching.

- WIS Graduate Round Table Discussions July, 2018
- Women in Science at Duquesne University held a round table discussion where high school and undergraduate students had the opportunity to ask graduate students questions about graduate school.

- Undergraduate Research Program (URP) Ethics Forum Mentor June, 2018
- Mentored 5 URP students on an ethical case that they discussed at the Duquesne University Ethics Forum. The case was on genome editing using CRISPR/Cas9.

- Graduate Student Research Symposium Moderator March, 2018
- Responsible for introducing the graduate speakers, providing an abstract on what their talk was be about and keeping track of the time.

COMMITTEES

- Women in Science (Graduate Student Representative) December 2017-Present
- The graduate student representative for the biological sciences. Responsible for representing the biology department in the Women in Science organization at Duquesne University.
 - Work with the rest of the executive board to plan and host events that inspire, inform, and empower women.
 - Co-leader of community outreach in charge of organizing and facilitating STEM events for local schools and communities.
 - Responsible for maintaining the Women in Science Facebook page.

- Graduate Students of Biological Sciences (GSoBS) August 2017-Present
Historian June 2018-Present
- Executive officer on the graduate committee that is reasonable for maintaining and updating the Duquesne University website for the graduate student page and the GSoBS page.
 - Maintains the GSoBS Facebook page.
 - In charge of photography and documentation of all graduate student events.

- Seminar Social Officer* August 2017-June 2018
- Executive officer on the graduate committee that is responsible for making sure refreshments are served for departmental speakers, and providing an opportunity for networking.

- Graduate Student Research Symposium Peer Selection Committee February, 2018
- Responsible for reviewing 45 abstracts submitted for oral presentations and selecting 24 presenters that will give talks at Duquesne University's Graduate Student Research Symposium in March 2018.

- GSoBS Mentor Award Committee May, 2017
- Served as a committee member to select the 2017 Duquesne University Biological Sciences Mentor.

OTHER PUBLICATIONS AND WRITING

D.U. Quark Journal
Duquesne University

November, 2018

- Won **3rd place** in the D.U. Quark Writing and Art Contest where my photographs of abandoned mine drainage, entitled “Beauty and the Beast” were featured in the journal

Wild Women of Reclamation Newsletter (WWR Spring 2018, vol. 3)
American Society of Mining and Reclamation

May, 2018

- Wrote an article, “The Study of Microbial Communities in Passive Remediation Systems”, for the Wild Women of Reclamation Newsletter discussing my research and how it applies to mining reclamation.

PROFESSIONAL DEVELOPMENT: TEACHING

November, 2018 *Mentoring Workshop*

- A workshop hosted by Women in Science at Duquesne University and lead by Anne Cox teaching how to start a mentor network. Discussed the key components of a successful mentor network, including get started, growing the network, and providing support.

October, 2018 *Approaches to Peer Writing Workshops*

- A workshop held by the Center for Teaching Excellence at Duquesne University that taught different peer workshop models, with an emphasis on peer writing workshops. Discussed benefits of peer workshops being integrated into courses and how to encourage productive feedback by the students.

October, 2018 *Fueling the Fire*

- A workshop held by the Center for Teaching Excellence at Duquesne University that taught strategies in designing assignments that allows the student to take ownership in their work, leading to an increase in student motivation.

October, 2018 *Book Study: Contemplative Practices in Higher Education*

- A Book Study held by the Center for Teaching Excellence at Duquesne University around the book: *Contemplative Practices in Higher Education: Powerful Methods to Transform Teaching and Learning* by Daniel Barbezat and Mirabai Bush. The two-part book study discussed ways to integrate contemplative pedagogy into your teaching through meditation and self-reflection.

April, 2018 *Certificate in University Teaching*

- Certificate completion required mastery of basics of teaching through the completion of workshops on various aspects of teaching
- Required observation of teaching and feedback by faculty and peers
- Participation in professional interactions about teaching and Learning
- Completion of a dossier showcasing my teaching portfolio

March, 2018 *Science Communication Fellowship at Phipps Conservatory*

- A communication workshop that is facilitated by the science education department at Phipps Conservatory and Botanical Gardens that teaches skills to communicate science in a way that breaks down barriers between the scientific community and the public

February, 2018 *Career Connectedness*

- A workshop held by the Center for Teaching Excellence at Duquesne University that discussed ways to have the students relate to the topic you are teaching by showing how it is applicable to the bigger picture (a career)

February, 2018 *Holistic Teaching*

- A workshop held by the Center for Teaching Excellence at Duquesne University that discussed ways to teach the whole student (physical, emotional, social, and spiritual)

February, 2018 *First Generation Students*

- A workshop held by the Center for Teaching Excellence at Duquesne University that discussed first generation college students and how it is important to be aware of the additional support these students may have and how to aid in their success

January, 2018 *Using Active Learning Techniques to Enhance the Pre-Lab Lecture*

- A workshop held by the Center for Teaching Excellence at Duquesne University that discussed ways to incorporate active learning into a lab setting

June, 2016 *GCAT-SEEK: Metagenomics Workshop - Teaching Assistant*
California State University at Los Angeles

- preparation of samples for high-throughput sequencing using 16S rRNA operon and Illumina tag PCR, E-gel electrophoresis, DNA quantification, and library quality checking
- Analysis of sequences after samples were run on Illumina MiSeq platform using Linux command line, USEARCH, QIIME (Quantitative Insights Into Microbial Ecology), and R studio
- Introduction to multivariate statistics such as core microbiome computation, Pearson correlations, alpha and beta diversity, and heat maps.

June, 2015 *GCAT-SEEK: Metagenomics Workshop*
Juniata College, Huntingdon, PA

- Preparation of soil samples for high-throughput sequencing using 16S rRNA operon by way of Illumina tag PCR, E-gel electrophoresis, DNA quantification, and library quality checking
- Analysis of sequences after samples were run on Illumina MiSeq platform using Linux command line, USEARCH, QIIME (Quantitative Insights Into Microbial Ecology), and R studio
- Introduction to multivariate statistics such as core microbiome computation, Pearson correlations, alpha and beta diversity, and heat maps

PROFESSIONAL DEVELOPMENT: RESEARCH

November, 2018 (Duquesne University, Pittsburgh, PA)

Introduction to 'tidy' data and statistics in R

- An introduction to R Studio and the use of basic statistical concepts used in big data. Additionally, covers the principles of tidy data

October, 2018 (Duquesne University, Pittsburgh, PA)

Getting Started in SPSS

- An entry level introduction to analyzing data in SPSS, including running basic statistics and visualization using graphs

October, 2018 (Duquesne University, Pittsburgh, PA)

Thriving amidst chaos: Time management strategies for work and life

- Workshop hosted by Women in Science at Duquesne University. Led by Dr. Susan Johnson from the University of Iowa, the workshop addressed several time stressors and effective strategies to handle them.

February, 2018 (Duquesne University, Pittsburgh, PA)

Tools for Creating Strong Conference Posters

- A workshop that presented strategies and tools for presenting an effective conference poster
- Talked about design, layout, and formatting, as well as effective tips in presenting

June-August, 2017 (University of Pittsburgh, Pittsburgh, PA)

R for Biologists

- A workshop that teaches how to code in R for biological applications

March, 2017 (Geological Society of America Workshop, Pittsburgh, PA)

An Introduction to QGS and Geoscience Application

- An introduction to the open source QGS and possible applications for mapping in geoscience.

August, 2015 (Coursera, John Hopkins University)

Introduction to Genomic Technologies

- An introduction to modern genomics and the common computing tools used to analyze next-generation sequencing.

July, 2015 (Coursera, John Hopkins University)

The Data Scientist's Toolbox

- An introduction to tools needed for analyzing big data sets, such as markdown, git, Github, and R.

CLEARANCES

- Act 31: Recognizing and Reporting Child Abuse (September 2018)
- Act 33: Pennsylvania Child Abuse History Clearances (July 2018)

- Act 34: Pennsylvania State Police Criminal Record Check (June 2018)
- Act 73: FBI Criminal Background Check (November 2015)

ORGANIZATION MEMBERSHIPS

- American Society for Microbiology (2016-Present)
- American Society for Mining Reclamation (2016-Present)
- The Geological Society of America (2016-Present)
- Graduate Students of Biological Sciences (GSoBS) (2016-Present)
- Graduate and Professional Student Council (GPSC) (2016-Present)
- Wild Women of Reclamation (2017-Present)
- Women in Science Duquesne University (2017-Present)
- American Association of University Women (2018)
- **Sigma Xi, The Scientific Research Honor Society (2018)**