

KEITH ARORA-WILLIAMS

I'm interested in developing user-friendly tools that identify significant patterns in complex data and visualize them in ways that are both quantitative and intuitive.

CONTACT

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EDUCATION

2020
|
2016

PhD, Environmental Health and Engineering

Johns Hopkins University 📍 Baltimore, MD

Advisor: Sarah Preheim

Title: Microbial Genes, Genomes and Taxa Associated With Key Aspects Of Pathogenesis and Biogeochemical Cycles

2018
|
2016

MS, Environmental Sciences

Johns Hopkins University 📍 Baltimore, MD

Advisor: Sarah Preheim

2013
|
2009

BE, Biomedical Engineering

SUNY: Stony Brook University 📍 Stony Brook, NY

GPA: 3.50 (Cum Laude), Deans List 7 semesters

2009
|
2007

CUNY: Baruch College 📍 New York, NY

- **GPA:** 3.85

- **Transfer:** from BS in Finance



RESEARCH EXPERIENCE

Doctoral Research Projects

[Preheim Lab](#), EHE@JHU

2020
|
2018

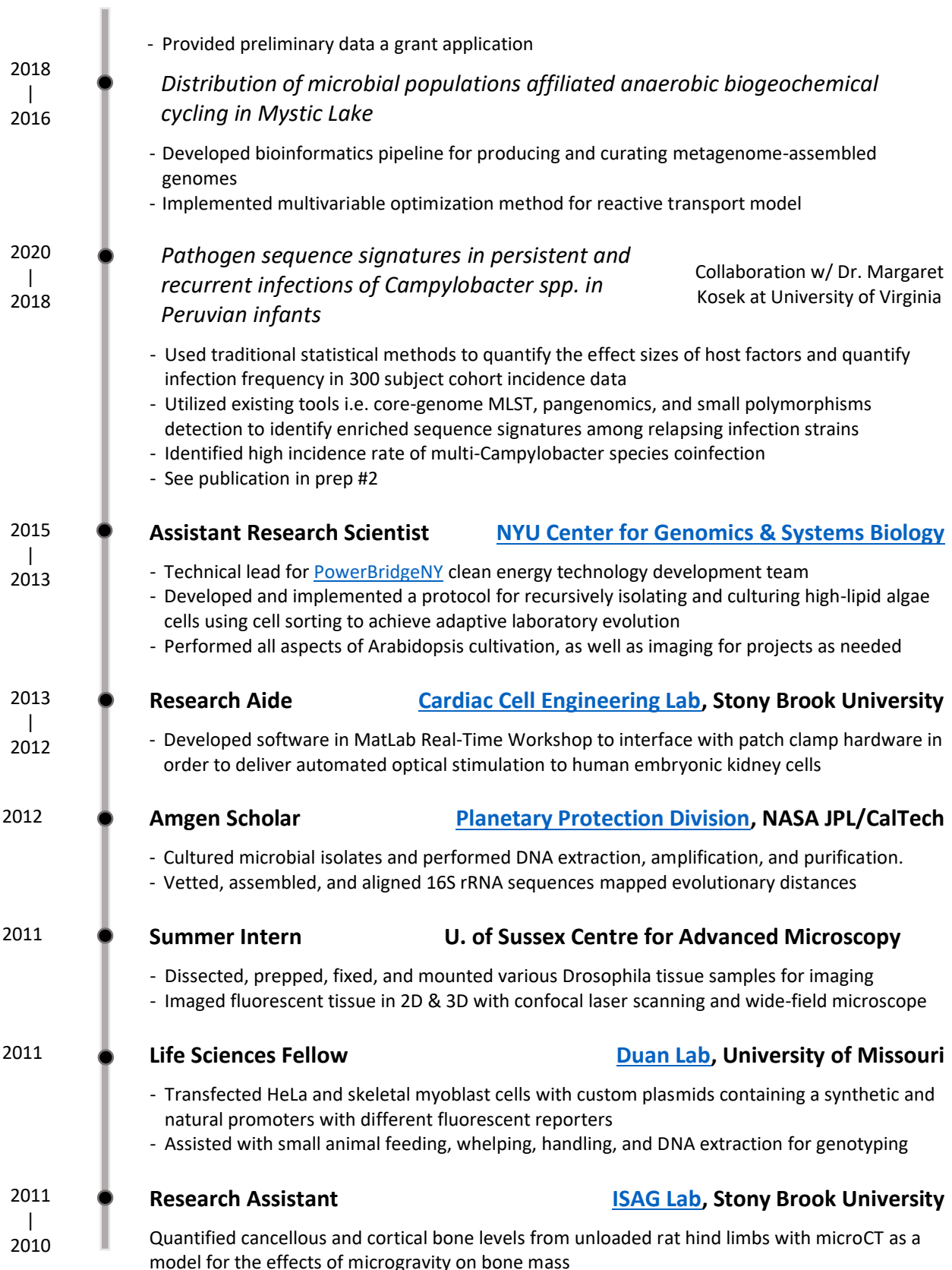
Biogeochemical cycling potential of the Chesapeake Bay water column microbiome

- Assisted with pumping, filtering, sampling and transportation of water samples from field site under the Bay Bridge near Annapolis, MD.
- Prepared amplicon and whole genome short read libraries from environmental samples and bacterial cell cultures.
- Developed bioinformatic pipelines for amplicon sequence-variant calling, performed genome binning, and taxonomic/functional annotation.
- Developed novel statistical methods for identifying significant spatiotemporal boundaries and synchronous abundance changes within the Chesapeake Bay microbiome.
- Provided preliminary data and written material for multiple grant applications
- See publications in prep #1, 3

2020
|
2019

The effects of intermittent aeration at different time scales on water column microbial community gene expression in Rock Creek

- Prepped, organized and managed a team of 15 student volunteers to participate in 3 weeks of daily sampling
- Trained/mentored 3 Masters & Undergraduate students in filtration, cell culture, DNA extraction, data management and analysis methods.
- Developed a flow cytometry-based bacterial cell staining and counting protocol





Publications and Patents

Microbial Community Assembly in the Chesapeake Bay: Beyond Seasonal Cycles and Spatial Gradients

- Arora-Williams, K., Zhang, Y., Secor, M., Unger, M., Sakowski, E., Xia, M., Ellis, J., Preheim, S.
- Status: In prep (#1)

Sulfur-oxidizing microbes are prevalent in the water column of the Chesapeake Bay

- Arora-Williams, K., Holder, C., Sakowski, E., Ellis, J., Gnanadesikan, A., Preheim, S.
- Status: In prep (#3)

Host factors and genomic correlates of persistent *Campylobacter jejuni* and *coli* infection isolates in a pediatric cohort.

- Arora-Williams, K., Schiaffino, F., Gray, H., Parker, C., Olortegui, M., Peñataro-Yori, P., François, R., Preheim, S., Kosek, M.
- Status: In prep (#2)

Capturing in situ Virus-Host Range and Interaction Dynamics through Gene Fusion with epicPCR.

- Sakowski, E., Arora-Williams, K., Tian, F., Zayed, A., Zablocki, O., Sullivan, M., Preheim, S., (2020) *Nature Microbiology*.
- Role: analysis support
- Status: In revision

Contribution of time, taxonomy and selective antimicrobials to antibiotic and multidrug resistance in wastewater bacteria.

- Gray, H., Arora-Williams, K., Young, C., Bouwer, E., Davis, M., Preheim, S. (2020) *Environmental Science and Technology*
- Role: analysis support
- Status: Resubmitted

Dynamics of microbial populations mediating biogeochemical cycling in a freshwater lake.

- Arora-Williams, K., Olesen, S., Scandella, B., Delwiche, K., Spencer, S., Myers, E., Abraham, S., Sooklal, A., Preheim, S. *Microbiome* 6, 165 (2018). 10.1186/s40168-018-0556-7

Systems and methods for selecting cellular strains

- Birnbaum, K. and Arora-Williams, K., 2018, US20180058987A1
- Status: Pending



Posters, Talks, & Workshops

2019

[Genomic variation among isolates from persistent *Campylobacter* infections in a pediatric cohort](#)

- Arora-Williams, K., Schiaffino, F., Gray, H., François, R., Parker, C., Olortegui, M., Preheim, S., Penataro-Yori, P., Kosek, M.
- **Lightning Talk**, *Campylobacter and Helicobacter and Related Organisms*. Belfast

2019

Attendee, M3 Mid-Atlantic Microbiome Meetup. Johns Hopkins University, Baltimore

- 2018 ● [Microbial and Water Quality Data Define Emergent Habitats in an Estuarine Water Column](#)
 - Arora-Williams, K., Holder, C., Sakowski, E., Preheim, S.
 - **Poster**, Environmental Health and Engineering Research Retreat. Baltimore
- 2018 ● **Attendee**, M3 Mid-Atlantic Microbiome Meetup, University of Maryland, College Park
- 2016 ● **Participant**, [The First Traditional Anvi'o Colloquium Workshop](#). International Symposium on Microbial Ecology, Montreal
- 2013 ● [Genetic and Metabolic Profiles of Microbes Isolated from the Mars Exploration Rovers.](#)
 - Arora-Williams, K., Schubert, W., Smith S., Childers, S., Paszczynski, A., Benardini, J.
 - **Poster**, American Society for Microbiology General Meeting, Denver



Teaching and Awards

- 2018 ● **TA and Grader for Environmental Health & Engineering Systems Design**
 - Presented analytic techniques frequently for public decision making. Emphasis is on mathematical programming techniques e.g. linear, integer, mixed-integer, and multi-objective programming. Spring term, graduate-level course
- 2018 | 2017 ● **TA and Grader for Data Analytics in Environmental Health and Engineering**
 - Presented approaches to model formulation, application, and interpretation in fields of computational statistics, data mining and machine learning. Fall term, graduate-level course.
- 2016 ● [National Science Foundation Graduate Research Fellowship: Honorable Mention](#)
- 2015 ● **Recipient of M. Gordon Wolman Fellowship from Johns Hopkins University**
- 2015 ● **Volunteer Judge in New York City Science and Engineering Fair**
- 2013 | 2012 ● **Tutor for Educational Opportunity Program at Stony Brook University**
 - Provided 1-on-1 supplemental lessons relating to Engineering Statics and Dynamics courses