

Mo Kaze

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Research Interests

I am currently a postdoctoral scientist, supervised by Dr. Jonathan Eisen at University of California, Davis, researching SARSCov2 surveillance from wastewater and best bioinformatics practices.

I am currently working with the Alameda County Public Health Department to process their backlog of SARSCov2 and carbapenem resistant enterobacteriaceae genomic data. I have also provided streamlined and automated analysis pipelines to cut down on manual data validation and procedural workflows. I am very proud to be serving my community in this capacity.

My research as a DOE Fellow, supervised by Dr. Susannah Tringe at JGI, focuses on engineered transitional systems, such as aqueducts and networks of irrigation canals. These engineered interfaces may be acting as "hotspots" with impacts disproportionate to their geographic area. The research project I developed involves mapping the biogeographical distribution of microorganisms and defining their functional potential across the water distribution system. My field green house gas sampling and metagenomic analysis will provide input data for predictive models of landscape features not currently reflected in climate models.

My doctoral research, with Dr. Mark Siström, involved investigating commercial biopesticide products' genomic content focusing on antibiotic resistance genes and viral sequences which have clinical and environmental consequences. My publications regarding biopesticides indicate these widely-used microbial products are behaving as unexpected reservoirs and vectors for antibiotic resistance and mobilizable genetic elements.

Education

University of California, Merced	PhD Quantitative & Systems Biology	2020
California State University, East Bay, Hayward, CA	MS Molecular Microbiology	2017
Mills College, Oakland, CA	BA Molecular Cell Biology	2013

Publications

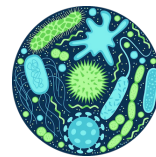
- Kaze, Mo, Mark Siström, and Lauren Brooks. "Antibiotic Resistance in Bacillus-based Biopesticide Products." *bioRxiv* (2021). **accepted for publication, *Microbiology*, 2021**
- Kaze, Mo, Lauren Brooks, and Mark Siström. "Genomic Sequence Analysis of Methicillin- and Carbapenem-Resistant Bacteria Isolated from Raw Sewage." *Microbiology Spectrum* 9.1 (2021): e00128-21.
- Lauren Elisabeth Brooks, Mo Kaze, and Mark Siström. "[A Curated, Comprehensive Database of Plasmid Sequences.](#)" *Microbiol Resour Announc* 8.1 (2019): e01325-18.
- Lauren Elisabeth Brooks, Mo Kaze, and Mark Siström. "[Where the plasmids roam: large-scale sequence analysis reveals plasmids with large host ranges.](#)" *Microbial genomics* 5.1 (2019).

Awaiting submission

- Mo Kaze, Lauren Elisabeth Brooks, and Mark Siström. "*Assessing the diversity of antibiotic resistant bacteria in waste water using a whole genome approach.*"
- Mo Kaze, Lauren Elisabeth Brooks, and Mark Siström. "*Welcome to Thunderdome: The Resistome and Virome of the Plasmidome.*"
- Mo Kaze, Lauren Elisabeth Brooks, and Mark Siström. "*Mixing with a Bad Crowd: ARG exchange between *Klebsiella pneumoniae* and *Bacillus* based-Biopesticides Leads to Carbapenem Resistant Phenotypes.*"

In process

- Mo Kaze, "*The Phage, Prophage, AMG and IME Content of Biopesticides.*"



Doctoral thesis

- Mo Kaze, "*Biopesticides as Unintentional Reservoirs and Vectors of Antibiotic Resistance Genes and Mobilizable Elements.*"

Skills

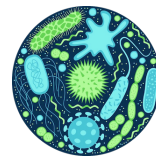
- Clinical and environmental microbiology
- Human cell, tissue, and microbial cell culturing
- Library prep, Next gen sequencing and analysis (illumina, Nanopore platforms), Hi-C
- Confocal, Super res, fluorescent, light microscopy and image analysis
- Bioinformatics scripting in Python, R, running tools on command line and high performance computing clusters
- Metagenomic assembly, annotation, and analysis, metabolic and functional pathway generation
- Viral enrichment, isolation, extraction, quantitation
- Protein purification and isolation, NMR and LCMS analysis, GHG analysis, biogeochemical analysis
- Experimental design, sample collection and processing
- Computational and statistical analysis
- Viral resuspension, concentration, and extraction
- Protein purification and isolation
- Scientific communication, grant writing

Awards

World Microbe Forum Abstract Award	2021
AI Inclusive Underrepresented Genders Scholarship	2021
UCM QSB Dissertation Award	2020
Department of Energy Science Graduate Fellowship	2019
Best Poster Microbiology Student Symposium	2019
UCM Summer Research Fellowship	2019
DOE Joint Genome Institute Distinguished Scholar	2018
Computational Biology Research Fellowship	2018
UCM Summer Research Fellowship	2018

Conference Presentations

- American Society for Virology 2020: *The Viral Content of Widely-used Biopesticides* (1st author) **talk**, poster - **postponed**
- American Society for Microbiology 2020: *Microbial Community Structure and Methane Production in a Large-scale Engineered Irrigation System* (1st author), poster - **postponed**
- American Society for Microbiology 2020: Title: *This Gras Isn't Greener: Biopesticides as Reservoirs and Vectors of Antibiotic Resistance* (1st author), **talk**, poster - **postponed**
- Microbiology Society Annual Meeting 2020: *Biopesticides as Unintentional Reservoirs and Vectors of Antibiotic Resistance genes* (1st author), **talk - postponed**
- Bay Area Ecology and Evolution of Infection Disease Meeting 2020: Title: *Poisoning the Apples? Investigating the Viral Content of Widely-used Biopesticides* (1st author), **talk**



- American Society for Microbiology 2019: Title: *Factors Influencing Microbial Community Composition of Historic and Restored Wetlands* (1st author), **talk**, poster
- Microbiology Student Symposium 2019: Title: *This GRAS Isn't Greener: Biopesticides as Unintentional Reservoirs of Resistance* (1st author), **talk**, poster
- Northern California Botanists Symposium 2019: Title: *Endophyte community shifts in response to drought in monkey flowers (*Erythranthe laciniata*) grown in native soil*, poster
- Northern California Computational Biology 2018: *Genomic Mining Reveals Reservoir of Resistance Biopesticides Used in California* (1st author), poster
- American Society for Microbiology 2018: Title: *Genomic Mining Reveals Reservoir of Antibiotic Resistance Genes in Widely Used Biopesticide* (1st author), poster
- American Society for Microbiology 2018: Title: *Harboring a Fugitive: Identifying Unexplored Vectors and Carriers of Antibiotic Resistance Plasmids*, poster
- American Society for Cell Biology 2016: UCSF and UC Berkeley poster presentation Title: *Whole-slide Imaging Approach to Assessing Allogenic Transplantation of hESC-CMs using Histological Analysis and Immunofluorescence* (1st author), poster
- American Society for Cell Biology 2016: Title: *Characterization of the Microbiome of a Geothermal Pool Proximal Species, *Pisolithus tinctorius** (1st author), poster

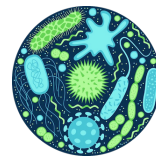
Professional Affiliations

American Society for Microbiology
American Society for Virology
Pride In STEM

Graduate Women in Science
Women in Bio
Microbiology Society

Teaching Experience

TEACHING ASSISTANT	UC MERCED - MERCED, CA	2017-2018
Courses:	Molecular Basis of Health & Disease Microbiology Lab	
ADJUNCT INSTRUCTOR	MERRITT COLLEGE - OAKLAND, CA	2016 -2017
Course:	Advanced Microscopy	
TEACHING ASSISTANT	CSU EAST BAY - HAYWARD, CA	2015 - 2017
Courses:	Microbiology Lab Intro to Biology Lab Intro to Microbiology Lab	
TEACHING ASSISTANT	MILLS COLLEGE - OAKLAND, CA	2011-2012
Courses:	Immunology Microbiology Nursing: Genetics Nursing: Microbiology	



Relevant Coursework

GRADUATE

- Computational Biology and Genomics [UC Berkeley]
- Microbial Physiology [UC Berkeley]
- Microbial Ecology [UC Berkeley]
- Microbial Genetics (audit) [UC Berkeley]
- Microbial Diversity and Evolution (audit) [UC Berkeley]
- Phylogenetics [UCM]
- Dynamics of Soil Organic Matter [UCM]
- Molecular Cell Biology I & Molecular Cell Biology II [CSUEB]
- Advanced Molecular Techniques [CSUEB]
- PCR & Fragment Analysis [CSUEB]
- Functional Genomics [CSUEB]
- Microbial Symbioses [CSUEB]
- Protein Chemistry [CSUEB]
- Environmental Microbiology [CSUEB]
- Parasitology [CSUEB]

POST-BACCALAUREATE

- Advanced Microscopy
- Live Cell Imaging
- Cell Culturing
- Immunohistochemistry

UNDERGRADUATE

- Genetics
- Immunology
- Microbiology
- Protein Chemistry & Enzymology
- Molecular Cell Biology

Service and Outreach

PANELIST - MILLS COLLEGE WOMEN AND STEM

2016

PANELIST - UC MERCED LGBT IN STEM

2017

UC MERCED GRADUATE DEAN'S ADVISORY COUNCIL ON DIVERSITY

2018 -2020

Research Experience

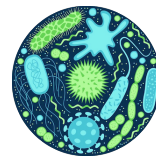
CLINICAL & ENVIRONMENTAL MICROBIOLOGY - UNIVERSITY OF CALIFORNIA, MERCED, CA DISSERTATION RESEARCH

Thesis project: Investigating Widely Used Microbial Products as Reservoirs and Vectors of Antibiotic Resistance

ENVIRONMENTAL MICROBIOLOGY - DEPARTMENT OF ENERGY / JGI; BERKELEY, CA - 2019- PRESENT

Project: Microbial Community Structure and Methane Production in California's Canal System

Responsibilities: experimental design, sample collection and processing, computational and statistical analysis, orthologous cluster analysis, scientific communication



ENVIRONMENTAL MICROBIOLOGY - JOINT GENOME INSTITUTE, DOE; WALNUT CREEK, CA - 2018-PRESENT

Project: Investigating Factors Influencing Microbial Community Composition in Bay Area Historic and Restored Wetlands

Responsibilities: computational analysis of large datasets, statistical analysis, orthologous cluster analysis, figure design, scientific communication

EXO BIOLOGY, NASA; CA, MT, WY - 2016 - 2017

Project: Archaea isolation and identification

Responsibilities: Research design, literature review, sample collection and environmental analysis at Norris geothermal pools in Yellowstone National Park, archaeal and bacterial cell culturing, DNA extraction, PCR, next-gen sequencing, biochemical analysis, LCMS and analysis, Super Res microscopy

MASTERS THESIS, CAL STATE EAST BAY, HAYWARD, CA; COMPLETED MAY 2017

Project: Characterizing the microbiome of a thermophilic fungus

Responsibilities: AHL extraction and GCMS analysis, documentation, microscopy and image analysis, protocol design, run undergraduate research team with journal club and personalized assignments, create supportive network for women and LGBT STEM students

MICROSCOPIST, UC BERKELEY CANCER RESEARCH LAB; BERKELEY, CA – 2015-2017

Projects: Histological Analysis and Immunofluorescence of Allogenic Transplantation of hESC-CMs, Imaging Toxicity Effects on Gut Tissue, Imaging Retinal Wound Tissue

HIV & AGING, UCSF; SAN FRANCISCO, CA - 2012-2013

Literature review, PPT presentations on topics and findings, study design, IRB applications and review, data collection & analysis

BIOPHOTONICS, MILLS COLLEGE; OAKLAND, CA 2011-2012

Project: bioengineering far red fluorescing cellular tags for HIV infection visualization

Responsibilities: Literature review, contamination troubleshooting, organizing samples, PCR, DNA sequencing & analysis, cell culturing, primer design, transformation, protein purification, spectrophotometry, documentation

Work Experience

GENOMIC DATA SPECIALIST, APHL & ALAMEDA COUNTY PUBLIC HEALTH; OAKLAND, CA – 2021 - PRESENT

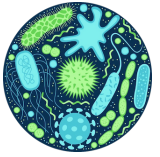
Bioinformatic analysis of SARS-Cov2 sequences, SNP analysis, genome submission to GISAID, CRE analysis, MLST workflow development, containerization (docker, WDL, Cromwell)

METAGENOMIC DATA ANALYST, CALIFORNIA STATE UNIVERSITY SAN MARCOS; REMOTE – 2021 - PRESENT

Metagenomic and statistical analysis for large scale stormwater project, bioinformatics training, student support (Beckett Lab)

IMAGING ASSISTANT, UC BERKELEY CANCER RESEARCH LAB; BERKELEY, CA – 2015-2017

Maintenance, fluorescent microscopy, sample preparation, technical support utilizing confocal and slide scanning, support staff for conferences and educational courses



IOS LEAD TEST ENGINEER, VOXER INC; SAN FRANCISCO, CA – 2013 - 2014

Automation development, documentation, issue tracking, managing offsite team, managing internal & external beta projects, presenting performance & progress data, business account liaison, metric analysis

SW ENGINEER, APPLE INC; CUPERTINO, CA – 2006-2011

Projects: iPhone, iOS, iTunes, iPhoto

Academic References

Dr. Mark Siström
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Merced, CA 95343 USA
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Dr. Carol Lauzon
MS Advisor
California State University, East Bay
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Dr. Susannah Tringe
DOE Advisor
Joint Genome Institute
Lawrence Berkeley National Lab
1 Cyclotron Road
Berkeley, CA 94720 USA
stringe@lbl.gov

Dr. Lauren E. Brooks
Utah Valley University
800 West University Parkway
Orem, UT 84058 USA
lauren.brooks@uvu.edu