Julia M. Brown, PhD
Research Scientist
Bigelow Laboratory for Ocean Sciences
East Boothbay, ME

email: julia@bigelow.org
Updated July 14, 2022

Appointments

2022-present   Research Scientist, Bigelow Laboratory for Ocean Sciences
2020-2022   Bioinformatics Scientist, Bigelow Laboratory for Ocean Sciences
2016-2020   Bioinformatician, Bigelow Laboratory for Ocean Sciences

---

Education

2015-2016   Postdoctoral Research Fellow
Albert Einstein College of Medicine, Bronx, NY
Department of Systems and Computational Biology
Postdoctoral advisor: Dr. Libusha Kelly

2015   Ph.D. in Microbiology, concentrations in Genomics and Ecology
Cornell University, Ithaca, NY
Dissertation: *Cyanobacteria-associated bacteriophage communities over scales of spatial, temporal and environmental change*
PhD advisor: Dr. Ian Hewson
Committee Members: Dr. Daniel Buckley, Dr. Nelson Hairston

2008   B.A. Chemistry *cum laude*, conc. Biochemistry
Carleton College, Northfield, MN

Background and Research Interests

Julia's research interests lie in understanding the ecological relationships of marine viruses using single cell genomes, other 'omics data and emerging technologies and bioinformatics methods.

Peer-Reviewed Publications*

Google Scholar: https://scholar.google.com/citations?hl=en&user=rGsro4wAAAAJ&view_op=list_works

*10 selected

Kauffman, Kathryn M, William K Chang, **Julia M Brown**, Fatima A Hussain, Joy Yang, Martin F Polz, Libusha Kelly (2022) **Resolving the structure of phage-bacteria interactions in the context of natural diversity** *Nature Communications 13(1):1-20* doi: https://doi.org/10.1038/s41467-021-27583-z

Yang, Joy Y, Wenwen Fang, Fabiola Miranda-Sanchez, **Julia M Brown**, Kathryn M Kauffman, Chantel M Acevero, David P Bartel, Martin F Polz, Libusha Kelly (2021) **Degradation of host translational machinery drives tRNA acquisition in viruses** *Cell Systems*

Kim, Woojoo E., Katherine Charov, Mária Džunková, Eric D. Becraft, **Julia Brown**, Frederik Schulz, Tanja Woyke, James J. La Clair, Ramunas Stepanauskas, and Michael D. Burkart (2021)

Synthase-Selective Exploration of a Tunicate Microbiome by Activity-Guided Single-Cell Genomics *ACS Chemical Biology*

Julia M. Brown, Jessica Labonté, Joseph Brown, Nicholas R. Record, Nicole J. Poulton, Michael Sieracki, Ramiro Logares, Ramunas Stepanauskas (2020) **Single cell genomics reveals viruses consumed by marine protists.** *Frontiers in Microbiology 11: 524828*

Maria G. Pachiadaki, **Julia M. Brown,** Joseph Brown, Oliver Bezuidt, Paul M. Berube, Steven J. Biller, Nicole J. Poulton, Michael D. Burkart, James J La Clair, Sallie W. Chisholm, Ramunas Stepanauskas (2019) **Charting the Complexity of the Marine Microbiome through Single-Cell Genomics**. *Cell* 7: 1623-1635

Kathryn M. Kauffman*, **Julia M. Brown*,** Radley S. Sharma, Dan VanInsbergue, Joseph Elsherbini, Martin Polz, Libusha Kelly (2018) **Viruses of the Nahant Collection, characterization of 251 marine Vibrionaceae viruses**. *Scientific data* 5: 180114. *co-first authors

Kathryn M. Kauffman, Fatima A. Hussain, Joy Yang, Philip Arevalo, **Julia M. Brown**, William K. Chang, David VanInsberghe, Joseph Elsherbini, Radhey S. Sharma, Michael B. Cutler, Libusha Kelly, Martin F. Polz (2018) "**A major lineage of non-tailed dsDNA viruses as unrecognized killers of marine bacteria**" *Nature* 25474

Ramunas Stepanauskas, Elizabeth A. Fergusson, Joseph Brown, Nicole J. Poulton, Ben Tupper, Jessica M. Labonté, **Julia M. Brown**, Maria G. Pachiadaki, Tadas Povilatitis, Brian P. Thompson, Corianna J. Mascena, Wendy K. Bellows, Arvydas Lubys (2017) "**Improved genome recovery and integrated cell-size analyses of individual uncultured microbial cells and viral particles**." *Nature communications* 8, no. 1: 84.

Julia M. Brown, Brenna M. LaBarre, Ian Hewson (2013) **Characterization of Trichodesmium-associated viral communities in the eastern Gulf of Mexico**. *FEMS Microbiology Ecology* 84: 603-613

Ian Hewson, **Julia M. Brown**, Colleen A. Burge, Courtney S. Couch, Brenna A. LaBarre, Morgan E. Mouchka, Mizue Naito, C. Drew Harvell (2012) **Viral assemblages associated with healthy and aspergillosis-affected tissues of the <u>Gorgonia ventalina</u> holobiont**. *Coral Reefs* 31: 487-491

Presentations*

* *Five most recent*

Julia M. Brown (June 24, 2021) Oral Presentation: "Observing virus sequences in thousands of uncultivated host cells using large scale single cell genomics." 2021 ASLO Aquatic Sciences Virtual Meeting

Julia M. Brown (March 31, 2021) Invited Seminar: "An unexpected snack for the ocean's tiniest eukaryotes." Maine Maritime Academy Cell Biology Seminar

Julia M. Brown (September 24, 2020) Seminar: "Caught in the Act: What viruses within cellular SAGs can tell us about ecology and evolution." Internal Bigelow Seminar, East Boothbay, ME

Julia M. Brown, Jessica M. Labonté, Joe Brown, Ramunas Stepanauskas (August 14, 2019) Poster Presentation: "Grazing on viruses? Accumulation of non-infecting viral DNA within picoeukaryote cells." ISME17, Leipzig, Germany

Julia M. Brown, Joe Brown, Jessica Labonté, Ramunas Stepanauskas (February 2, 2018) Oral Presenation: "Accumulation of viral DNA in marine picoeukaryote cells suggests the importance of viral ingestion in microbial trophic interactions." 2018 Ocean Sciences Meeting, AGU Portland, OR

Teaching and Mentorship

Bigelow Laboratory for Ocean Sciences

2022	Course in Bioinformatics of Microbial Single Cell Genomes, Co-chair and instructor at Bigelow Laboratory; website: https://bigelowlab.github.io/2022-bioinformatics-course/
2022	Software Carpentry Workshop Organizer and Instructor at Bigelow Laboratory
2021	Data Carpentry Workshop Organizer and Instructor at Bigelow Laboratory
2020	Co-mentor to undergraduate REU intern Abigail Adams-Beyea
2019	Data Carpentry Workshop Organizer and Instructor at Bigelow Laboratory
2018	Data Carpentry Workshop Instructor for New England Tribes, USGS, Augusta, ME
2018-Present	Certified Carpentries Instructor

Cornell University

2014	BioG 1140: Foundations of Biology Teaching Assistant (1 semester)
2014	BioMi 2910, 2911: Introduction to Microbiology Lab Instructor, Lecture Teaching Assistant (1 semester)
2013	BioMi 3910: Advanced Laboratory in Microbiology Teaching Assistant (1 semester)
2009, 2013	BioMi 2910, 2911: Introduction to Microbiology Teaching Assistant (3 semesters)
2011, 2012	Graduate mentor to summer undergraduate research assistants
2008-2014	Introduction to Microbiology small group section instructor (11 semesters)

Carleton College

2008	Introduction to Chemistry Tutor
2006-2008	Organic Chemistry 1 and Chemical Equilibrium and Analysis lab teaching assistant

---

Grants, Honors and Awards

2022	NSF EAGER: Microencapsulation-based genomics of individual RNA viruses ($299,524)
2020	NSF EAGER: Encapsulation and sequencing of extracellular DNA ($299,178)
2014	CALS Microbiology TA of the Year ("The Golden Apple")
2010	Small Grant, Cornell Biogeochemistry and Environmental Biocomplexity ($3450.00)

Volunteer and Service

Reviewer: Geobiology, Molecular Ecology, FEMS Microbial Ecology, Frontiers in Microbiology, Microbiome, Science Advances

2018-2020	Facilitator for mid-coast Maine Girls Who Code
2017	BLOOM Chaperone, Bigelow open house activities coordinator
2016	BLOOM Program field volunteer, Bigelow Laboratory Open House Science Activities Coordinator
2013	Invited Speaker at Homer Junior High School Career Day
2012	Co-host and speaker at Field of Microbiology Students Bioinformatics Symposium
2012	Social Media Coordinator for Frontiers in the Life Sciences Symposium, Cornell University
2011-2012	Co-President of the Field of Microbiology Students
2011, 2009	Expand Your Horizons workshop volunteer

Laboratory Training, Research and Field Experience

2018	Field collection of marine sponges and tunicates in West Boothbay Harbor, ME
2011-2014	Field sample collection at Green Lakes State Park, Fayetteville, NY for Dissertation Research
2011	Summer Course in Microbial Oceanography at University of Hawaii Center for Microbial Oceanography: Research and Education (C-MORE)
2010	Bermuda Institute of Ocean Sciences (BIOS) Summer Course in Microbial Oceanography
2010	Research Expedition in the Eastern Tropical South Pacific on the R/V Atlantis; Chief Scientist: Dr. Doug Capone
2009, 2010	Summer Field Research at Shoals Marine Lab, Appledore Island, Gulf of Maine
2008-2009	Graduate rotation projects: *Exploring the Metabolic Potential of Dehalococcoides ethenogenes and Characterizing Transcription of Reductively Dehalogenating Enzymes of Dehalococcoides ethenogenes*; Advised by Dr. Ruth Richardson and Dr. Stephen Zinder
2007	Student research project aboard the SSV Seamans with SEA Semester: *The Virus to Bacteria Ratio in Changing Nutrient Environments of the Eastern Tropical Pacific;* Advised by Chief Scientist Dr. Kara Lavender Law
2007	Carleton College Chemistry Department undergraduate research assistant; *Development of ^{32}P assays to Characterize tRNA Structure and tRNA Synthetase Activity;* Advised by Dr. Joe Chihade

---

Computational Experience

Github: https://github.com/juliambrosman
Developed Software Packages and Code Repositories:
- SAG-MG-Recruit**:** https://github.com/BigelowLab/sag-mg-recruit
- batch-viruSCope**:** https://github.com/BigelowLab/viruscope
- GORG-figures: https://github.com/BigelowLab/GORG-figures
- VC-Profiler: https://github.com/BigelowLab/VCProfiler

HPC Computing:
- Bigelow Laboratory for Ocean Sciences HPCC; Linux CentOS
- Job scheduling with PBS-Pro, SLURM

NGS data experience:
- Microbial single cell genomics, viral genomics
- Assembly workflow development, assembly curation
- Metagenomic read recruitment to single cell genomes
- Virus sequence identification within single cell genomes
- Comparative analyses of viral metagenomes

Computing experience:
- Languages: python, R, bash
- Workflow management: snakemake
- Laboratory Information Management System "Basespace Clarity LIMS" (Illumina): workflow development, scripting and maintenance
- Data Science Tools: git, conda, Jupyter, Cytoscape, networkx, scipy, RStudio, sqlite, XML
- Other Software: Adobe Illustrator
- Operating Systems: Linux CentOS, MacOS