

Jacob Michael Green

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Education

- University of Rhode Island, Kingston, RI
Fall 2019 – Present
PhD Candidate in the Biological and Environmental Sciences
Concentration: Evolution and Marine Biology
- California State University, Monterey Bay, Seaside, CA
Fall 2015 – Spring 2018
Bachelor of Science in Biology
Concentration: Molecular Biology
Minor: Chemistry
Major GPA: 3.82
Cumulative GPA: 3.302
- Santa Barbara Community College, Santa Barbara, CA
Associates of Arts in Biology, Chemistry, Liberal Arts
Fall 2011 – Spring 2015
- GRE scores
Verbal: 158 Math: 153 Analytical Writing: 5

Research Interests

- Marine Biology - How marine organisms utilize physiological mechanisms to respond to changing ocean condition. Host/pathogen interactions between marine phages and echinoderms.
- Molecular Biology – viral-cell surface recognition, inhibition of regenerative pathways transcription/translation regulation, RNA interference, signaling pathway mechanisms, protein folding and sorting, lytic/lysogenic regulation mechanisms.
- Biochemistry - enzymatic activity and feedback inhibition, utilization of glycoconjugates for cell communication, localization, and apoptotic mechanisms.
- Bioinformatics – sequencing analysis, genomic assembly, transcriptome assembly, metagenomics, differential gene expression analysis, data management, data carpentry.

Research Experience

- **Graduate Research Assistant**
Puritz Lab, University of Rhode Island, Kingston, RI
Mentor: Dr. Jonathan Puritz
June 2018 – August 2018

Project: Unlocking the exome: exploring de novo assembly options for capture sequencing using the Eastern Oyster (*Crassostrea virginica*).

Relevant Skills: DNA tapestation, cDNA library synthesis, larval growth management, BioConda environments, SSH command line, server job management, cloud computing workflow design, utilizing various open-source bioinformatics software: Spades, TransSpades, Transabyss, Trinity, Oases, Dedupe, BWA, Diamond, BUSCO, and other analysis software.

- **Researcher**

Logan Lab, California State University, Monterey Bay, Seaside, CA

Mentor: Dr. Cheryl Logan and Jake Cline

May 2016 – Present

Project: De novo assembly of the brown rockfish transcriptome and comparative differential gene expression analysis with assemblies that varying in k-mer sizes and coverage.

Relevant Skills: Cloud computing services (Atmosphere, cyverse, amazon-web services), server job management and design, leveraging open-source bioinformatics programs: trinity, oasis, transabyss, sour mash, DESeq2. Utilization of multiple computing environments (shell, python, MySQL, R studio). Program engineering and design of bioinformatics workflows.

Project: Study the physiological mechanisms rockfish use in order to acclimate to changing ocean conditions such as hypoxia, ocean acidification, and combined stressors.

Relevant Skills: enzymatic spectrophotometry analysis of lactate dehydrogenase and citrate synthase, enzyme extraction/purification, RNA extraction/purification, RNA fragment analyzer, tissue homogenization, TECAN m200 absorbance reader, Magellan, BCA analysis, data analysis through RStudio and Excel

Project: Adaptive sampling of juvenile copper rockfish and deployment of conductive, temperature, and density (CTD) instrumentation to capture physiological response to ocean acidification and hypoxia

Relevant Skills: Development of research methodology for sub-surface field work. Facilitating and contributing the permitting process. Conducting underwater collection of juvenile fishes with hand nets and flow trolls. Deploying CTD instrumentation and data collection. Primary dissection on juvenile fish utilizing dry ice.

- **Researcher**

Crandall Lab, California State University, Monterey Bay, Seaside, CA

Mentor: Dr. Eric Crandall

August 2017 – Present

Project: Phylogenetic structure of *Ctenochaetus striatus* in the coral triangle, emphasis on Dongsha atoll as a source or sink of genetic diversity for this species in the region.

Relevant Skills: Develop hypothetical structure for five models of larval migration. DNA extraction, mtDNA control region PCR amplification, and sequencing of *C. striatus* gill samples. Carried out phylogenetic analysis creating a haplotype network and calculating genetic structure statistics. Bayesian skyline plot development coupled with migrate-n for population expansion and identification of source meta-populations.

- **Undergraduate Researcher**

Jue Lab, California State University, Monterey Bay, Seaside, CA

Mentor: Dr. Nathaniel Jue

January 2017 – June 2018

Project: Developing a comparison program to identify differences in de novo transcriptome assembly of non-model Poeciliid fish altering Kmer and coverage sizes.

Relevant Skills: Analyzing statistical frameworks used for data assembly programs such as Hidden Markov Models and de brujin graphs. Creating scripts to generate 10 transcriptomes from the same reads altering Kmer size and coverage. Developing downstream transcriptome analysis pipeline.

- **Molecular Biologist Intern**

Molecular Biology Lab, Santa Barbara City College, Santa Barbara, CA

Mentor: Dr. James Doohan

August 2014 – April 2015

Projects: Study of RuBisCO expression in pea plants responding to changes in light cycles. Extraction of Taq polymerase for molecular biology lab utilization. Recovery of bacterial strain library after lab refrigerator failure. Beetle barcoding and experimental analysis of LCO1 and HCO1 forward and reverse primers.

Relevant Skills: enzyme extraction/purification, Western Blotting, Southern Blotting, electrophoresis, gel storage, sterile technique, bacterial streaking, genetic sequence analysis,

Education and Professional Experience

- **Student Oceanography Club Science Mentor**

Monterey Bay Aquarium, Monterey, CA

August 2018 - Present

Coordinator: Kim Swan, Jen Keliher, Ben Bence

An after-school program for middle school students where they learn about ocean conservation and marine science and who would like to make a difference in their local communities. Students visit scientific institutions, meet scientist, work with other teens, and learn about ocean conservation while participating in hands-on activities. Mentors are science leaders that guide the “tribe”, along with their high school “tribe leader”, in field experiences and on-site aquarium related activities. Mentors seek to inspire conservation of the world ocean in the next generation through support and inquiry.

- **Volunteer Advisory Council Member**

Monterey Bay Aquarium, Monterey, CA

June 2017 - Present

Coordinator: Loraine Lomax and Jim Covell

A select group of active volunteers operating in leadership capacities to identify and prioritize key areas of improvement for the volunteer experience. Increase volunteer impact and serve to use volunteers’ unique perspectives and experiences to inform volunteer program initiatives and associated Aquarium decisions. Develop recommendations for volunteer programs and the Aquarium Conservation Partnership (ACP) to be presented to Aquarium leadership for consideration.

- **Apprentice Guide**

Monterey Bay Aquarium, Monterey, CA

September 2015 - Present

Coordinator: Loraine Lomax

Facilitated visitor handling of sensitive marine organisms. Attended seminar and public events to develop effective modes of communication to different audiences and enrich working knowledge of aquarium exhibits. Stimulated conversations by using science to inspire conservation of natural

resources. Interpreted aquarium exhibits and the complex interaction of the different habitats within the Monterey Bay.

- **Supplemental Instruction Leader: Genetics (BIO 311), Organic Chemistry (CHEM 211 & 210), Practical Computing for Biologists (BIO380)**

California State University, Monterey Bay, Seaside, CA

August 2016 – June 2018

Cooperative Learning Center

Coordinator: Jon Detka

Meet with professor to establish course topics and themes. Develop study guides, practice exams, and worksheets. Tutor students in both individual and group settings. Facilitate and design exam review sessions that outline key course concepts and identify difficult problems. Develop positive interdependence between students and foster atmosphere of inclusivity.

- **Professional Development Mentor for UROC Summer Research Program**

California State University, Monterey Bay, Seaside, CA

June 2017 – August 2017

Undergraduate Research Opportunity Center

Coordinator: Gerick Bergsma, Carla Fresquez, Natasha Oehlman

Develop professional development mentorship model with UROC staff for future summer research programs. Present professional development lectures to a class of 60 summer researchers from UROC summer research program, NOAA EPP, and REU students (ex. Important of Reflection). Meet weekly for an hour with research writing groups to help new researchers develop abstracts and posters. Facilitate online or face-to-face summer research support cumulating in 100 hours of support over summer 2017.

- **Educator**

Santa Barbara Museum of Natural History, Santa Barbara, CA

April 2012 – May 2015

Coordinator: Shaila Noakes

Facilitated low-income school groups through the various stations within the sea center. Trained to work with oceanographic tool such as Van Dorn bottle, Secchi disk, plankton tow, and crab nets. Developed sea water chemistry project to measure changing temperature and salinity. Volunteered for special events for donors and projects such as Mission Creek Gala Ball and Santa Barbara Wine & Food Festival.

Leadership and Achievements

- 2018 Sally Casanova Pre-Doctoral Summer Research
Summer research fellowship that allows for scholars to carry out a summer research experience
- 2017-2018 Sally Casanova Pre-Doctoral Scholar
Scholarship community that provides support for graduate school trips and research
- 2017 Fort Ord Alumni Scholarship Awardee
Demonstrating academic achievement, leadership, and community service through making valuable contributions to the campus, region, and the nation
- 2016 Ronald E. McNair & Undergraduate Research Opportunities Center (UROC) Scholar
Scholarship communities that provides support for graduate school and personal development.
- Awarded third place in UROC Fall Research Showcase

Presented summer research on Juvenile Rockfish Acute Response to Ocean Acidification in a competitive forum.

- Fall 2016 – Fall 2015 California State University Monterey Bay Dean's List
Recognized as an excellent student through class performance by meeting 3.75 semester GPA
- 2015-2014 Armstrong Biology Scholarship Awardee
Demonstrating academic excellence and a passion for the biological sciences
- 2015-2014 President of SBCC Biology Club
Led the largest student-based club on campus through developing library outreach programs, elementary science night education, campus fundraising, supporting science discovery day
- 2015 Outstanding Club Achievement Award: SBCC Bio Club
Recognized by the Board of Supervisors as an on-campus organization that set an example of community outreach and developed programs that enriched the relationship of students.
- 2015-2014 ICC council member
Worked in conjunction with other clubs to develop coordinated events such as Club Day, organizing donors for on-campus foodbank, and facilitating inter-club comradery
- 2014 Molecular Biologist of the Year
Recognized by faculty and staff of the Biological Sciences department as a student that excelled in molecular biology lecture and lab while seeking to help other students.
- 2014-2013 Vice President of SBCC Biology Club
Participated in a council of students that developed on-campus events, science nights at elementary schools, outreach into local community, and club enrichments through student leadership.

Poster Presentations

- Unlocking the Exome: Exploring de novo Assembly Options for Capture Sequencing. Western Society of Naturalists. Hotel Murano, Tacoma, WA, November 2018.
- Finding the Tools: Using Multiple Assemblers to Generate a Complete Transcriptome from a Non-Model Larval Marine Fish, *Sebastes auriculatus*. Western Society of Naturalists. Hilton Pasadena Hotel, Pasadena, CA, November 2017.
- Juvenile Rockfish (*Sebastes* spp.) Do Not Shift Metabolic Poise Under Ocean Acidification. Co-presenter, Authors: A.J. Cline, J.M. Green, H.W. Fennie, E.G. Mattiasen, N.S. Kashef, D.M. Stafford, S.M. Sogard, C.A. Logan. Western Society of Naturalists, Hyatt Regency Hotel, Monterey, CA, November 2016
- Enzymatic Response of Juvenile Rockfish to Ocean Acidification. SACNAS National Diversity in STEM conference, Long Beach Convention Center, Long Beach, CA, October 2016
- Enzymatic Response of Juvenile Rockfish to Ocean Acidification. UROC Summer Research Symposium, California State University Monterey Bay, Seaside, CA August 2016

Oral Presentations

- From Farms to the Ocean. UROC ambassador to TRIOS program, California State University Monterey Bay, Seaside, CA, June – July 2017.
- Importance of Reflection. PDM capacity. UROC Summer Research Program, California State University Monterey Bay, Seaside, CA, June 2017.
- Enzymatic Response of Juvenile Rockfish to Ocean Acidification. Fall Undergraduate Research, Scholarship, & Creative Activity Showcase, California State University Monterey Bay, Seaside, CA, November 2016. Awarded third place.

Broader Impacts

- Volunteering at marine science institutions has allowed me to speak with many people over the course of five years about the complex interactions that occur between marine organisms and their environment, the ocean. It has also given me the opportunity to educate the public about climate change and the solutions that scientific research has generated to solve these problems. Both institutions where I have volunteered time cater to low-income and minority schools by providing free admission for school field trips and programs curated for educating a diverse array of students.
- As President of the Santa Barbara City College Biology Club I created the Library Outreach Program which brought the myriad of teaching specimens from the Robert J. Profant Museum to the school library to expose non-STEM majors to major themes within biological sciences. The program “March Through the Phyla” was a collaborative effort between the club, volunteers, and library staff to create monthly presentations of live and preserved specimens for students to interact with while in the library.
- As a member of the Santa Barbara City College Biology Club we attended school science nights at low-income school where we would bring every specimen that we transported to the kids’ school. At Citrus Glen Elementary school, our club created and ran the science night with topics such as DNA electrophoresis, handling of spiders, vibration experiments, and making silly putty. This allowed us to go into low-income and minority school to promote STEM through outreach and education.

Certifications and Skills:

- AAUS scientific diver. Institution CSUMB. Instructor Dr. James Lindholm. DSO Frank Degnan
- NAUI Master Diver Certification. Institution CSUMB. Instructor Dr. Charmaine Robinson. DSO Frank Degnan
- CPR, First Aid, O₂ administration, Field Neurological Examination
- Data Intensive Summer Biology Institute: Non-model mRNAseq workshop certification. Institution UC Davis. Instructor: Dr. Titus Brown
- CRLA level I tutor
- Proficient in: Cloud Computing, SSH, UNIX, Python, R, Excel, Adobe CC, Microsoft Office.