MICHAEL OVERTON

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I am a biologist and educator dedicated to making scientific ideas accessible, engaging, and relevant to diverse learners. I have a 9-year history of leading students to a deeper understanding and appreciation of the natural world by integrating clear communication, active learning, and a supportive, inclusive environment. My teaching is grounded in academic empowerment, intellectual rigor, social and conceptual connection-building, and the holistic growth of students and the community.

EDUCATION

DOCTOR OF PHILOSOPHY, Biology — *2025*

University of California San Diego
Revealing the genetic variation that drives loss of heterozygosity rates in yeast
Advisor: Dr. Sergey Kryazhimkskiy

MASTER OF SCIENCE, Environmental Biology — *2019*

Cal Poly Pomona
Genetic and Bioinformatic Characterization of Sulfolobus Turreted Icosahedral Virus 3
Advisor: Dr. Jamie Snyder

BACHELOR OF SCIENCE, Biological Sciences — *2016*

Cal Poly Pomona

TEACHING EXPERIENCE

TEACHING ASSISTANT — *2019 – 2021 and 2024 – 2025*

School of Biological Sciences, University of California San Diego

- Led discussion and lab sections for 6 diverse courses: introductory biology, population genetics, bioinformatics, molecular methods in evolution, and recombinant DNA techniques
- Developed and delivered engaging material to support and enhance learning objectives for classes up to 100 students, including hands-on activities, small group work, lecture slides, and study sessions
- Provided personal instruction and guidance to help students navigate course concepts and broader academic life
- Collaborated with instructional teams weekly: coordinating learning targets, providing/receiving feedback, and strategizing student success
- Adapted course content and instruction style to preserve student learning through the COVID-19 pandemic

TEACHING ASSOCIATE — *2015 – 2019*

Department of Biological Sciences, Cal Poly Pomona

- In collaboration with instructor, designed new microbial ecology lab course, wherein students perform quantitative genetic and metabolic profiles on their collected environmental samples
- Contributed to the redesign of an introductory biology lab, including course structure, experimental designs, and lab notebook content
- Handled logistical and teaching responsibilities for a molecular biology lab – ordering and preparing materials, providing theoretical and practical instruction, and troubleshooting failed experiments

MENTORING EXPERIENCE

RESEARCH MENTOR — *2021 – 2023*

Kryazhimskiy Lab, University of California San Diego

- Supervised and trained 8 high-school and undergraduate students to perform experiments in molecular and cellular biology
- Emphasized the application of hypothesis testing and experimental design, laboratory techniques, data analysis, and scientific communication
- Facilitated research opportunities for students from under-represented backgrounds through involvement with ENLACE and BUMMP programs
- Advised students in attaining scholastic goals and navigating academia

RESEARCH EXPERIENCE

GRADUATE RESEARCH ASSISTANT *2021 – 2023*

Kryazhimskiy Lab, University of California San Diego

Improved computational methods to detect and analyze loss of heterozygosity events in yeast

- Designed custom genotyping, filtering, error detection, and analysis scripts in shell and R and applied them to both lab-generated and public datasets
- Developed statistical models to reveal important genetic factors driving mitotic recombination in yeast

Experimentally testing a CRISPR-Cas9 gene drive for mutagenic activity

- Whole-genome sequenced 300 yeast clones from a large-scale mutation accumulation experiment
- Validated gene drive activity by mating, tetrad dissection, selection, and phenotyping

Modeling the physiological effects of mutations in yeast

- Genetically engineered and barcoded a phylogenetically structured family of yeast strains
- Developed novel procedures for attaining and measuring steady-state exponential growth in cell populations
- Tested the explanatory power of bacterial growth theory on the fitness and transcriptomic effects of mutations

Served as lab manager – training, inventory, maintenance; and safety coordinator – auditing and ensuring compliance with waste disposal, PPE, and emergency preparedness policies

RESEARCH ASSOCIATE *2015 – 2019*

Snyder Lab, Cal Poly Pomona

Molecular and bioinformatic investigations into the evolutionary history and replication cycle of the extremophilic archaeal virus STIV

- Developed novel methods for viral propagation, genome extraction, cloning, southern blotting, and qPCR
- Doubled the yield of virus purification by combining ultracentrifugation with a novel staining procedure
- Optimized random mutagenesis, transformation, and screening experiments to identify amino acid residues essential to the viral lysis protein
- Wrote a bioinformatics pipeline to resolve the phylogenetic structure of three viral sub-types
- Trained and supervised five undergraduate assistants and managed lab inventory and safety
- Set up and maintained lab equipment, including incubators, thermocyclers, and a liquid chromatography instrument

AWARDS AND GRANTS

Pathways in Biological Sciences training grant *2021 – 2023*

National Institutes of Health

Excellence in Teaching Award *2020*

University of California San Diego

BioTIER training grant *2017 – 2019*

National Science Foundation

PUBLICATIONS AND ABSTRACTS

Overton, M.S., Kryazhimskiy, S. (2025). Improved Genotype Inference Reveals Cis- and Trans-Driven Variation in the Loss-of-Heterozygosity Rates in Yeast. *bioRxiv*. DOI:10.1101/2025.06.26.661874v1 and *in review*

Overton, M.S., Guy, S.E., Chen, X., Martsul, A., Carolino, K., Akbari, O.A., Meyer, J.R., Kryazhimskiy, S. (2023). Upper Bound on the Mutational Burden Imposed by a CRISPR-Cas9 Gene-Drive Element. *bioRxiv*. DOI:10.1101/2023.11.28.569142 and *in review*

Overton, M.S., Manual, R.D., Lawrence, C.M., Snyder, J.C. (2023) Viruses of the Turriviridae: an emerging model system for studying archaeal virus-host interactions, *Frontiers in Microbiology*, 14, p. 1258997. DOI: 10.3389/fmicb.2023.1258997

PRESENTATIONS AND POSTERS

Overton, M.S., Kryazhimskiy, S. (2024). Effects of deletion mutations on yeast transcriptome are consistent with a resource partitioning model of the cell. *The Allied Genetics Conference*, Washington D.C. Poster.

Overton, M.S., Kryazhimskiy, S. (2023). Upper Bound on the Mutational Burden Imposed by a CRISPR-Cas9 Gene-Drive Element. *Gordon Research Conference*, Easton, MA. Invited presentation.

Overton, M.S., Guy, S.E., Kryazhimskiy, S. (2022). Upper Bound on the Mutational Burden Imposed by a CRISPR-Cas9 Gene-Drive Element. *Population, Evolutionary, and Quantitative Genetics Conference*, Pacific Grove, CA. Poster.

Overton, M.S., Brown, V., Snyder, J.C. (2018). Genetic and bioinformatic characterization of a new Sulfolobus Turreted Icosahedral Virus (STIV) variant. Presented at the *13th Annual College of Science Research Symposium,* Cal Poly Pomona. Poster.

Overton, M.S., Brown, V., Snyder, J.C. (2018). Genetic and bioinformatic characterization of a new Sulfolobus Turreted Icosahedral Virus (STIV) variant. Presented at the *Research, Scholarship, and Creative Activities (RSCA) Program,* Cal Poly Pomona. Poster.

Buckley, N., Vitheranage, H., **Overton, M.S.** (2017). Innovation of Molecular Biology Techniques Course. *12th Annual College of Science Research Symposium,* Cal Poly Pomona. Poster.

SKILLS

Curriculum development	Inquiry-based and active learning	Clear, precise communication
Learning assessment	Written and visual materials	Remote/hybrid instruction
Molecular biology techniques	R and shell coding	Statistical analysis

REFERENCES

Dr. Sergey Kryazhimskiy	*PhD advisor*	skryazhimskiy@ucsd.edu	(858) 822-3796
Dr. Sarah Stockwell	*Instruction supervisor*	sstockwell@ucsd.edu	(858) 534-0174
Dr. Jamie Snyder	*Master's advisor*	jcsnyder@cpp.edu	(909) 869-5598