



MMI 291 Seminar Series

Current Theme: Interdisciplinary Research
Winter Quarter 2023 – CRN 33700

Friday Seminar – 12:10-1 p.m. – Hybrid & Zoom
Genome & Biomedical Sciences Auditorium 1005

“The Taxonomy and Genomic Analysis of Select Pigment Producing Bacteria”

Exit Seminar - Research

Bacterial pigments are secondary metabolites that in addition to color have several useful properties including antimicrobial activities. Due to their promising applications, the discovery of new bacteria and new bacterial pigments is in the forefront of scientific research and economics. Pigmented bacteria can also be isolated from natural environments, especially freshwater and marine habitats and should be studied in greater detail because out of all the secondary metabolites having antibiotic activity, pigments and associated bacteria are an understudied group. I first investigated the pigmented bacterium *Pseudomonas carnis*, a contaminant of soymilk and tofu that can cause a brilliant blue color defect in refrigerated food substrates. The investigation of the blue coloration of soy foods involved taxonomic classification of *P. carnis* using whole genome comparative phylogenomics, and genomic analysis of pigment associated genes. In my second study, nine new strains of bacteria were isolated from the environment, including a purple *Janthinobacterium* strain which was observed growing on tofu. I used a multifaceted approach involving phylogenomic and genomic methods to assign strains to existing species and describe five new species of bacteria. My final study focused on creating a model for predicting violacein production in cultured or uncultured bacteria and used phylogenomic methods. I investigated how horizontal gene transfer of violacein genes has contributed to the pigment's distribution throughout the bacterial tree of life taking into consideration that most violacein-producing bacteria are members of the Gammaproteobacteria phylum. This research has helped lay a foundation for future studies on the evolution of pigment genes throughout bacterial populations and highlights the need for further studies focused on the potential functional importance of understudied secondary metabolites and the taxonomic classification of the bacteria that produce them.

Publications

De León, Marina E., Harriet S. Wilson, Guillaume Jospin, and Jonathan A. Eisen. "Draft Genome Sequences and Genomic Analysis for Pigment Production in Bacteria Isolated from Blue Discolored Soymilk and Tofu." *Journal of Genomics* 9 (2021): 55. doi: [10.7150/jgen.65500](https://doi.org/10.7150/jgen.65500)

January
13



Marina E. De León
Ph.D. Candidate, Jonathan Eisen
Lab, Medical Microbiology &
Immunology, Genome Center
UC Davis

January 13, 2023
12:10 – 1 p.m.
ZOOM Meeting

Medical Microbiology
& Immunology
School of Medicine

Seminar Contact:
Autumn Vega
530-752-9401
advega@ucdavis.edu

We hope to see you there!