

Identifying the Microbial Origins of Black Spot Disease in Sea Urchin *Lytechinus pictus*

Jenna Luc, San Diego State University, San Diego, CA

Abstract:

“Black spot” or “bald” sea urchin disease (BSD) is a spectrum of pathogenic infection that adversely affects adult sea urchins, a keystone species in every marine ecosystem. The incidence of BSD is increasing with global warming as microbial marine populations shift with climate change. The source of BSD has yet to be characterized in the painted urchin (*Lytechinus pictus*), although epidemics are emerging in local and lab-reared populations of Southern California. Infected urchins display a progression of symptoms, starting with loss of spines and degradation of skin tissues on the urchin test/skeleton. In severe progression of the disease, these lesions can permeate into the skeleton and cause death. A strain of *Vibrio* bacteria is strongly associated with BSD lesions in the adult test of purple sea urchins; however, literature is sparse on the original source of the infection. By isolating possible microbes from BSD positive adult urchins, a systems-level understanding of how these isolates are able to establish their pathogenic niche can be built.

The overarching goal of this research is to unravel the complexities of black spot disease in the local keystone species, *Lytechinus pictus*. First, understanding the symptoms and progression of BSD in *L. pictus* will provide insight to contributing factors in the emergence of the disease. Results of this study can be used to compare existing information of other sea urchin species. In addition to this, the current gap in the etiology through cultivation and isolation of microbes associated with BSD infected urchins will broaden the field of host-pathogen interactions. In identification of a particular microbe, further research to explore possible pathogenic factors could cater information regarding other marine pathogens. Overall, providing a foundation for understanding the interplay between the pathogen behind black spot disease and *Lytechinus pictus* is the primary objective of this research.

Biography:

I (Jenna Luc) am currently a second-year master's student in the cell and molecular biology program, with a concentration in microbiology. Sea urchins are a keystone species in every ocean in the world, so understanding another perspective in protecting these animals are imperative to both the

environment and advancing the field of microbiology. My research project includes isolating culprits and understanding the mechanisms behind a necrotic lesion-forming disease in adult sea urchin, *Lytechinus pictus* - the painted sea urchin. I plan to defend my master's thesis in Summer 2024, where I will then start a PhD program in Fall 2024 in microbiology/immunology.