

<b>Project Id</b>	102
<b>Project Title</b>	Effects of UVR on accumulation of sunscreens and stress proteins
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<b>Additional Faculty</b>	
<b>Faculty Department</b>	Biological Sciences
<b>Project Description</b>	<p>The goal of this project is to examine how ultraviolet radiation (UVR) and algal diet effects accumulation of natural sunscreens, mycosporine-like amino acids (MAAs) and stress-related proteins (e.g. heat shock proteins) in eggs and embryos of the purple sea urchin, <i>Strongylocentrotus purpuratus</i>.</p> <p>My laboratory investigates how marine organisms are affected by natural solar UVR using sea urchins as a model system. We investigate morphological and protein responses to UVR. In addition, we investigate how sea urchins acquire MAAs from their algal diets. My previous students have identified MAAs in field-collected sea urchins and developed sensitive assays to quantify damage caused by UVR, so we can perform similar experiments comparing embryos with high or low levels of MAAs. To understand whether exposure to UVR may affect reproduction, development of offspring, production of stress proteins and accumulation of MAAs, we reared <i>S. purpuratus</i> that were exposed to or protected from UVR and fed either MAA-rich or MAA-poor algae for six months during year 1 of this project. Gonads and epidermis of sea urchins were sampled three times over five months for proteins and MAAs. We collected over 600 samples for MAA analysis and a similar estimate for analysis of stress –induced proteins. We are in Approximately 30% of the MAA samples have been analyzed. In year two of this project, we need further assistance analyzing samples using high performance liquid chromatography for MAAs and using gel electrophoresis and western blotting (or proteomic analysis) for proteins.</p> <p>This study will allow us to better determine how quickly and how specifically MAAs are accumulated. In addition, it will allow us to understand whether sea urchins produce and utilize stress-related proteins in their gonads, gametes and epidermis in response to UVR exposure.</p>
<b>Interdisciplinary Nature Description</b>	This project involves the fields of marine ecology, developmental biology, biochemistry and biotechnology. Student will be required to participate in our Pier Open House activities and share the details and results of their work with the public at scientific conferences.
<b>Links</b>	
<b>Number of Honors Students Requested</b>	2
<b>Applicable Majors</b>	BIO, CHEM

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