

<b>Project Id</b>	119
<b>Project Title</b>	Drugs from the Sea: Biologically Active Compounds from Marine Sources.
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<b>Additional Faculty</b>	
<b>Faculty Department</b>	Chemistry and Biochemistry
<b>Project Description</b>	<p>The field of Marine Natural Products has aided in the development of a number of new treatments for human disease. The National Cancer Institute has developed an excellent screen for anti-cancer compounds, which has led to the discovery of highly bioactive components in marine organisms. Among these are discodermolide, eleutherobin, dehydrodidemnin B, bryostatin 1, dolastatin 10, and ecteinascidin 743. The deep water Bahaman sponge, Discodermia dissolute, yielded the cytotoxic polyhydroxylated discodermolide, which was determined to have microtubule stabilizing effects. ,</p> <p>The primary objective of this project is to identify novel compounds from marine invertebrates which show activity against human diseases. Samples of marine sponges and tunicates will be collected by SCUBA and returned to the Cal Poly campus for workup. At Cal Poly each extract will be tested for cytotoxicity by simple and inexpensive bench-top disease bioassays such as the Artemia sp. lethality test and the potato disk assay. Samples will also be submitted to collaborators at the University of California Santa Cruz for extensive bioassay screening in anti-cancer, anti-microbial and anti-malarial assays.</p> <p>The workup of samples will include microanalysis by high performance liquid chromatography coupled with mass spectroscopy (HPLC-MS) to obtain UV and molecular weight data. This data will be used to search the literature, and therefore identify known compounds. Priority will be given to extracts that contain compounds that are both active and novel. These will be purified by liquid-liquid extraction with solvents of differing polarity, followed by High Performance Liquid Chromatography (HPLC) utilizing a Photo Diode Array detector to obtain pure compounds. Initial characterization of crude extracts and will be performed on the 300 MHz NMR located within the Cal Poly chemistry department. Identification of new and known compounds will be facilitated by the use of marine literature databases such as Marin Lit. Complete compound characterization of novel structures will be performed at the NMR facility at UC Santa Cruz.</p>
<b>Interdisciplinary Nature Description</b>	<p>This project is highly interdisciplinary and combines three main STEM areas The main fields are as follows:</p> <ul style="list-style-type: none"> <li>• Chemistry; in the isolation of compounds and the elucidation of novel structures,</li> <li>• Biology; in the taxonomy of marine invertebrates,</li> <li>• Biomedical Science/Pharmacology; in the development and running of disease based assays</li> </ul>
<b>Links</b>	

<b>Number of Honors Students Requested</b>	3
<b>Applicable Majors</b>	CHEM, BIO, BMED
<b>desired_res</b>	Desired but not mandatory: Chemistry 316-317-318, 319, SCUBA or other ocean experience.
<b>Date Added</b>	2008-10-20 10:21:32
<b>Active</b>	1