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Department of Marine Sciences
Presents a Seminar by

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Biomarkers and Environmental Stress: Relevance of Cellular Responses in Determining Adverse Outcomes

Biomarkers are measurable changes in a biological system indicative of an interaction with a chemical, physical, or biological agent. Such changes can be molecular, biochemical, physiological, or histological and can be reflective of either xenobiotic exposures or effects. Molecular and cellular biomarkers play a vital role in biomedical and human health research but their use in ecotoxicology and environmental risk assessment has been limited. Challenges associated with biomarker research and their role in understanding adverse outcomes will be discussed using case studies. These studies describe the use of biochemical and cellular assessments in marine bivalves (oysters and clams) under various stress conditions. The stressors presented include exposures to hypoxia, pharmaceuticals (antihypertensive drugs), and graphene oxide nanoparticles in three separate studies. Together, these studies highlight factors that can affect biomarker assessments, such as dosage, duration of exposure, test species and tissues, and interactions between contaminant and its environment. The discussion also represents the value of mechanistic linkages and molecular interactions to interpret biomarker data. A recent conceptual framework, Adverse Outcome Pathways (AOPs), organizes and links biomarker information to an adverse outcome of regulatory relevance at organismal and population levels. Such integration of cellular markers enhances our understanding of organismal responses to stress and increases the predictive value of biochemical changes. There is a current need for biomarker research to feed into such frameworks and to develop reliable approaches aimed at environmental risk assessment.

Host: Evan Ward

Time & Date: 11:00 am, Friday, April 13, 2018

Place: Marine Sciences Building, Seminar Room 103

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