



SPRING 2014 SEMINAR SERIES

DEPARTMENT OF OCEAN, EARTH, AND ATMOSPHERIC SCIENCES
3PM – ROOM 200 IN THE OCEANOGRAPHY/PHYSICS BUILDING
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“Developing the molecular toolkit to identify diatoms and determine their iron status in the field.”

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ABSTRACT

Diatoms are an abundant and widespread group of phytoplankton responsible for significant amounts of primary production in the ocean, thus exerting a profound influence on global carbon cycling. It is widely accepted that iron (Fe) controls diatom production in many ocean systems and the Fe stress response has been a focus of research for some time. Assessing the Fe status of natural diatom populations has proven challenging, as diatom species in the same genus may be difficult to distinguish using microscopy and the physiological and molecular responses to Fe stress can vary widely within a genus. This often makes the interpretation of mixed community gene expression using non-targeted approaches difficult to interpret. A companion approach is to elucidate genes whose expression is tightly coupled to a specific physiological response in laboratory experiments with ecologically relevant species. These genetic indicators of Fe stress can be used as sensitive and high-throughput markers of physiological status in field populations. Using a variety of molecular approaches, I have developed genetic fingerprinting methods to identify diatoms in field samples, as well as to follow the Fe status of *Thalassiosira oceanica*, a centric diatom that persists in low Fe regions. These methods have been used on two field expeditions to the Northeast Pacific Ocean that sampled across gradients of Fe from the coast to the open ocean. By targeting a diatom that is tolerant to low Fe, the Fe status marker method may indicate where the phytoplankton community as a whole is growth limited for Fe and can also be used to probe Fe bioavailability of different Fe pools.

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