



“Functional Genomics of *Karenia brevis*: Insights into Molecular Processes Regulating Florida Red Tides”

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Location: Florida International University, PCA 150

Abstract:

The dinoflagellate *Karenia brevis* is responsible for red tides in the Gulf of Mexico that cause extensive marine mortalities and human illness due to the production of brevetoxins. Although the oceanographic mechanisms regulating its bloom dynamics have been studied extensively, the cellular processes regulating bloom growth, toxicity, and termination are less well understood. I will present recent findings using functional genomics that reveal some remarkable molecular strategies *Karenia brevis* uses that may confer it competitive advantage in forming and maintaining blooms. Foremost is the apparent reliance of the dinoflagellate on post-transcriptional regulation of gene expression. Transcription appears to be largely constitutive, with pre-mRNAs processed through a spliced-leader trans-splicing mechanism that results in a stable pool of messages being available for translation-on-demand. Cell cycle regulation, stress responses, and toxin biosynthesis are important processes regulated through this mechanism. This adaptation may reflect its large genome size, condensed chromatin structure, and absence of nucleosomes to selectively regulate availability of the DNA for transcription.

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