

Data Management Plan

“Collaborative Research: Linking physiological and molecular aspects of diatom silicification in field populations”

The focus of this proposal is to merge cellular physiology, molecular biology, biochemistry and oceanography to better understand, on a molecular level, the factors that regulate diatom silica production in the sea. All significant findings from the proposed work will be promptly prepared and submitted for publication with authorship that accurately reflects the contributions of those involved. Findings will also be presented at appropriate scientific meetings, such as the annual American Society for Limnology and Oceanography meeting.

We propose a cross-disciplinary approach combining molecular analysis of gene and protein expression with field-based measurements of diatom silicification processes. Proposed work will generate both lab-based data as well as field data from two proposed oceanographic research cruises off the west coast of the United States. Lab-generated experimental data will consist of sequence information from metagenomics and metatranscriptomic analyses and immunoblot analyses. All sequence data will be submitted to the GenBank database at NCBI (<http://www.ncbi.nlm.nih.gov/>), and when appropriate, the Community Cyber infrastructure for Advanced Microbial Ecology Research and Analysis (CAMERA; <http://camera.calit2.net/>). The aim of CAMERA is to serve the needs of the microbial ecology research community by creating a rich, distinctive data repository and a bioinformatics tools resource that will address many of the unique challenges of metagenomic analysis.

Field data will consist of oceanographic data from CTD casts on cruises, as well as profile data of nutrient concentration, biogenic silica concentrations and silica production rates and gene expression information. Additional deckboard experiments will determine the uptake kinetic parameters K_s and V_m for the resident diatoms and associated shifts in Si related gene expression. These data will be submitted to the Biological and Chemical Oceanography Data Management Office (BCO-DMO) to archive our collected data in accordance with the NSF OCE policies on data archiving and dissemination. Data sets and associated metadata will be made available in Excel-compatible spreadsheets. Where appropriate, metadata will be submitted on the metadata forms developed by BCO-DMO. Metadata will include variable names, derived units, experimental set ups, analysis methods, descriptions of synthesis or calibration procedures where appropriate, data location, season, and quality control information. Variable names, keywords and metadata standards will follow guidelines available from the Marine Metadata Interoperability Project (marinemetadata.org).