

The types of data collected during this research will include properties of vesicles and single microalgal cells in terms of morphology, chemical composition, stable isotope assimilation, size and abundance measurements, and responses to environmental cues. These types of data have been successfully generated in the PI's group, from planning the research through to dissemination in peer-reviewed publications and presentations at national and international meetings.

1. Products of Research

This project will generate data via 2 avenues: 1) characteristics of vesicles released in response to various stimuli and 2) characteristics of phytoplankton cells that produce them. Measurements include size, shape, abundance, and biochemical cargo, and stable isotope enrichment. Collection of data and quality control will follow rigorous internal guidelines. The primary file format of most data generated will be tab delimited text files but other formats will be generated upon request. The exceptions being: (i) microscopic images from Raman, AFM, and Cryo-EM surveys archived as *.tiff, *.bmp, and *.jpg files, (ii) individual Raman spectral data files archived and organized by experiments and taxonomic groups as *.wdf files using the Renishaw Wire 5.1.1 software and converted to *.txt and *.xls files for spectral and statistical analyses. All experimental (non-image) data will finally be stored in tab delimited text files that are compatible with excel or other spreadsheet software. The total size of any of these files will not exceed 10MB.

2. Data Storage and Preservation

Primary storage of all data will be on hard drives of NARMIL instruments' CPUs and backed up on Taylor group's cluster. Our group will also use external hard drives that are kept off-site and pay for cloud-based storage to prevent data loss in case of damage to the local facilities.

3. Data Formats and Metadata

The raw experimental data and text files will be accompanied by simple text files of metadata about the details of each experiment, including for example, environmental conditions, species and cell counts, growth rate variability along with information about the model formulation. These metadata files will be created by the researcher from a standard template at the start of each experiment.

4. Data Dissemination & Policies for Data Sharing and Public Access

After quality control and publication or 2 years from collection, whichever comes sooner, our data will be uploaded to the Biological and Chemical Oceanography Data Management Office (<http://bcodmo.org/>). Taylor's group has routinely posted data from the CARIACO Ocean Time Series to BCO-DMO (<https://www.bco-dmo.org/project/2047>). Any new protocols developed of general interest to the community will be published on www.protocols.io (e.g., <https://www.protocols.io/view/modified-filter-transfer-freeze-ftf-technique-for-ikqccvw>).

5. Roles and Responsibilities

Currently, data back-up is set up to run automatically from a computer in the NAno-Raman Molecular Imaging Laboratory (NARMIL). That computer is remotely accessible and all participants upload their data to that machine to facilitate data backups and general technical administration of data storage. NARMIL's technician and post-doctoral fellow will both monitor proper functioning of the system.