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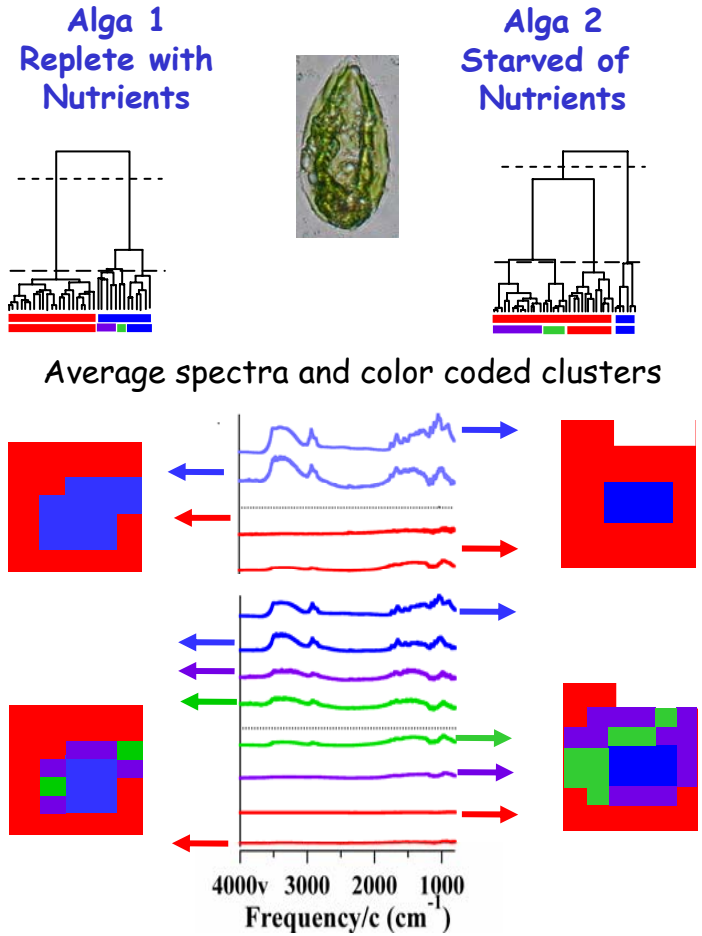
# CHE- 9984931
## Chemical Imaging of Individual Algal Cells

Objective: Measure and assess the abundance of macromolecular pools within and around algal cells under different external stresses.

An international, interdisciplinary team (including a physicist from Jordan, Dr. Zuheir El Bayarri) is using high resolution chemical imaging combined with statistical analysis to understand the nutrient abundance within individual algal cells with infrared synchrotron radiation. This approach allows a rapid method for identifying the nutritional status and the physiological responses to perturbation in resource availability of natural and laboratory phytoplankton populations. For example, the abundance of the macromolecular pools is important for modeling the response of algae to external stresses. This leads to a greater understanding of Harmful Algal Blooms (HABs) which can result from pollution from nitrates (fertilizers) or ammonium (sewage dumping) or changes in carbon supply ($CO_2$). The work is being performed at the Synchrotron Radiation Center University of Wisconsin, Milwaukee. The PI is assisting with the establishment of a synchroton in Jordan (SESAME) and is teaching Middle Eastern scientists the range of experiments available using this form of radiation.




Agglomerative Hierarchical (AH) clustering methods are used to objectively cluster the spectra from individual 6 x 6 micron pixels, arriving at average spectra. In this way similarities and differences due to nutrient stress may be identified.