

KN3 - Strategies of the microbial eukaryote for life and photosynthesis adrift in the seaAlexandra Z. Worden¹¹Monterey Bay Aquarium Research Institute, Moss Landing, CA 95039, USA.

Nearly half of global primary production occurs in the marine biosphere. The microbial eukaryotic algae that perform photosynthesis in marine environments come from diverse Supergroups and deep-branching lineages are still being discovered. Here, we will discuss efforts to establish baseline information on phytoplankton communities in the world oceans and to understand their divergence at the genomic level. The latter underlies their respective capacities to adapt or acclimate to future ocean conditions. Hence, comparative genomics and knowledge coming from an emerging three-species model system, using the widespread, tiny, fast swimming picoeukaryote *Micromonas*, are being combined with field research to gain more predictive understanding of physiological responses to natural and anthropogenic perturbations. Important here is integration across transcriptomic, proteomic and biophysical measurements, and together the results also allow us to consider features of the green algal progenitor of all land plants. Collectively, these types of studies are key ingredients for establishing a baseline against which future changes in microbial community structure can be assessed – and the evolutionary processes that gave rise to the green lineage.