Where's the P in Plankton? Phosphorus allocation to DNA across different picoplankton of the Sargasso Sea

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Phosphorus is a critical nutrient for survival in oligotrophic, or low nutrient, environments like the Sargasso Sea. Understanding where picoplankton allocate cellular phosphorus can offer insight into phosphorus cycling in regions like the Sargasso Sea. We hypothesized that the highest percentage of cellular P will be allocated towards DNA. We performed DNA extractions using four different extraction kits and determined Promega Reliaprep Blood gDNA Miniprep System to be the most efficient. We extracted DNA from cultured picoplankton which are representative of the most abundant species in the Sargasso Sea: *Synechococcus* (WH8102), *Prochlorococcus* (MED4 and MIT9301), and heterotrophic bacteria (HTCC2516 and HTCC2601). We also extracted DNA from cultured *Crocosphaera* (WH8501). Crocosphaera had the highest amount of DNA per cell. However, *Synechococcus* allocated the highest percentage of cellular phosphorus towards DNA and had the most copies of its genome per cell ($\geq$ 2 copies). The percentage of P allocated towards DNA varies across microbial species and across strains within the same genera. Having more copies of the genome per cell, not necessarily a larger genome size, may correlate with allocating a larger percentage of cellular P towards DNA. By understanding how phosphorus cycling works on the molecular level in different species of picoplankton, we can develop a greater understanding of the role of these picoplankton in phosphorus cycling as a whole in the Sargasso Sea.