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The role of prokaryotes in the oceanic caarbon cycle

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Over the past three decades, several studies have examined the abundance, biomass, and production rate of prokaryotes in various marine environments. These studies have revealed that prokaryote consume, on average, 50% of primary production in pelagic ecosystem and play important roles in major biogeochemical processes, such as nutrient cycling and organic matter fluxes. In addition, studies have shown that prokaryotic biomass is comparable to, or even exceeds, phytoplankton biomass in oceanic environments, with prokaryote representing an important trophic link in marine pelagic food webs. Moreover, studies, which based on the novel molecular biology analyses, have revealed surprisingly diverse prokaryotic community in marine environment. And these studies have revealed spatiotemporal patterns in prokaryotic community composition. However, our knowledge of the role of individual prokaryotic subgroups in biogeochemical cycles remains limited. To examine the internal dynamics of prokaryotic communities and their implications for biogeochemical cycling in marine systems, it is important to understand 1) the spatiotemporal variation in individual bacterial subgroups; 2) mechanisms underlying community structure controls; 3) contributions of individual groups to carbon flow in microbial food webs. In this presentation, I discuss recent progress in microbial oceanography, emphasizing the importance of prokaryotes in determining the oceanic carbon cycle.

Keywords: prokaryotic community, oceanic carbon cycle