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Marine microbial phosphorus biogeochemistry: molecular insights into the phosphorus cycle

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Phosphorus is fundamental to life. This phosphorus is utilized and transformed by microbes in the sea driving complex metabolic and biogeochemical dynamics as the phosphorus moves between inorganic and organic forms and between dissolved and particulate phases. Once considered relatively simple, the phosphorus cycle is now recognized to be increasingly complex, with the cycling of reduced forms and unexpected linkages to the cycling of iron, and other metals. Knowledge about the microbial biogeochemistry of phosphorus in the sea has been rapidly advancing. These advances are driven in part by new methods and molecular approaches. This overview will highlight aspects of marine microbial phosphorus biogeochemistry with an emphasis on recent areas of discovery, and provide examples of the role that phosphorus plays in driving the distribution and activities of marine microbes, and the complimentary role that marine microbes play in phosphorus cycle transformations.