Constraining the global phytoplankton metallome, one cell at a time

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Abstract

Phytoplankton require transition metals for a range of physiological processes, and the combination of these micronutrients comprises the cell's metallome. As with macronutrients, the uptake and subsequent regeneration of metals by phytoplankton has significant impact on their distributions, with phytoplankton serving to couple the biogeochemical cycles of the various nutrients. In the first part of my talk I will discuss the phytoplankton metallome: how it has been measured; how it varies between regions and taxa and environmental conditions; and what it might reveal about the physiology of cells in natural communities. In the second part of my talk, I will address the apparent *decoupling* of metals from macronutrients that occurs as phytoplankton sink and are degraded. Recent work to better constrain metallomes in the ocean has demonstrated different fates for phytoplankton macronutrients and micronutrients, in ways that may challenge our understanding of trace metal biogeochemistry. This talk will explore the many ways that cell composition informs our understanding of ocean biogeochemistry.