

## Saito Lab Marine Bioinorganic Chemistry: Cobalt and Vitamin B<sub>12</sub> Biogeochemistry

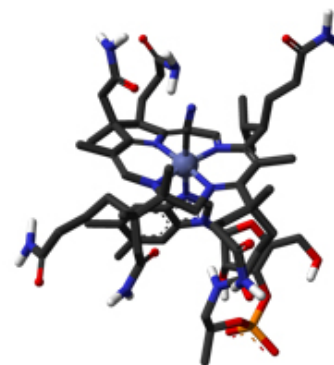
### Collaborators

Funded by NSF Chemical Oceanography

### PROJECT SUMMARY

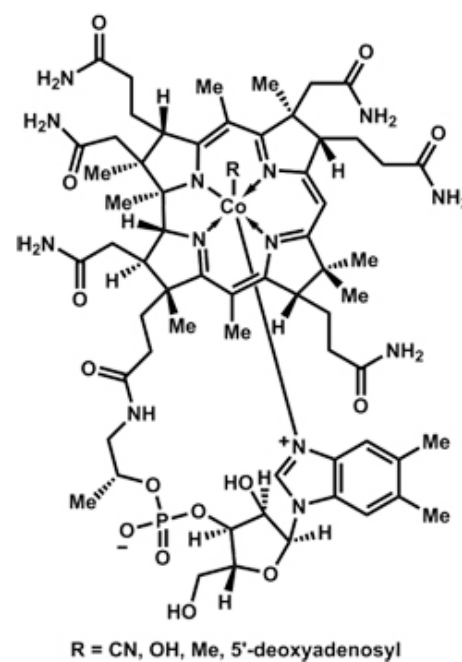
Vitamin B<sub>12</sub> is a cobalt containing biomolecule found in exceedingly low quantities in seawater. It is required for use by many eukaryotic phytoplankton in the marine environment and hence is an important micronutrient. The element cobalt is also an important micronutrient to both cyanobacteria and eukaryotic phytoplankton in the marine environment and also is found in extremely low concentrations. Because vitamin B<sub>12</sub> (also called cobalamin) contains a cobalt atom in the center of its corrin ring structure, the biogeochemistry of these micronutrients must be interconnected. In recent years we have observed colimitation of tropical environments by cobalt and iron, and colimitation of polar waters by B<sub>12</sub> and Fe. In addition, the bioavailability of cobalt appears to be strongly controlled by natural organic ligands that bind cobalt. Yet, the biosynthesis of B<sub>12</sub> using ambient seawater cobalt is an important and unstudied process. We are studying the connections between these two micronutrients, Co and B<sub>12</sub>, using analytical and physiological studies to measure key chemical and biological parameters.

*Last updated: December 14, 2009*



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Mail: Woods Hole Oceanographic Institution, 266 Woods Hole Road, Woods Hole, MA 02543, USA.

E-Contact: [info@whoi.edu](mailto:info@whoi.edu); press relations: [media@whoi.edu](mailto:media@whoi.edu), tel. (508) 457-2000

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