

**It's not easy being green:
Investigating Fe acquisition
strategies by analyzing Fe
distribution in *Synechococcus* sp.
PCC 7002 under different Fe
scenarios**

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Iron as an essential micronutrient

Fe bioavailability is a limiting factor for growth of phytoplankton in oceanic environments. While Fe is an abundant element in the Earth's crust, the formation of insoluble Fe-oxides means that Fe is often less accessible for phytoplankton. [1] *Synechococcus* sp. PCC 7002 (hereafter *Synechococcus*) is a marine cyanobacteria able to harvest light energy. Maintenance of their photosynthetic machinery requires efficient Fe acquisition strategies to fulfill high Fe requirements. The exact mechanisms for Fe acquisition have yet to be fully understood. [2]

Methods

Synechococcus was grown in modified Aquil [3] and subjected to Fe sources of varying bioavailability. Changes in dissolved ferrous iron (dFe(II)) concentration was monitored using FIA-CL, while different fractions (total, dissolved, particulate, intracellular) of iron were measured using HR-ICP-MS. State of the photosynthetic machinery and growth of *Synechococcus* were assessed using spectroscopic methods.

Results and further research

Synechococcus showed stress response when grown with less bioavailable forms of Fe. Changes in dFe(II) concentration indicate reduction of sFe(III) by *Synechococcus*.

Further research will focus on comparatively studying *Synechococcus* mutants with deletions in genes involved in Fe uptake.

[1] Jickells, An, et al. (2005), *Science*, 308, 67-71. [2] Kranzler, Lis, et al. (2014), *ISME J* 8, 409-417 [3] Morel, Rueter, et al. (1979), *Journal of Phycology*, 15, 135-141