

Supplement figure S1. Distributions and spatial correlations of Fe, P and S in single trichomes. Light micrographs, false-color element (P, S, and Fe) maps, one-dimensional line plots of Fe, P, and S along the main axis of the trichome sections, and scatterplots of pixel-specific element concentrations [CPS] of Fe and S versus P extracted from the 1D line plots of *Trichodesmium* trichomes collected during exponential growth (Exp. I) are shown. For each trichome two sections were analyzed to illustrate the variance in the relationship between Fe and P and S and P within a single trichome. The color scale for the element maps is shown, with warmer colors indicating higher element concentrations. Black line: linear regression.