Supporting information

Cryptic cycling of Fe(III)-organic matter complexes by phototrophic Fe(II)-oxidizing bacteria

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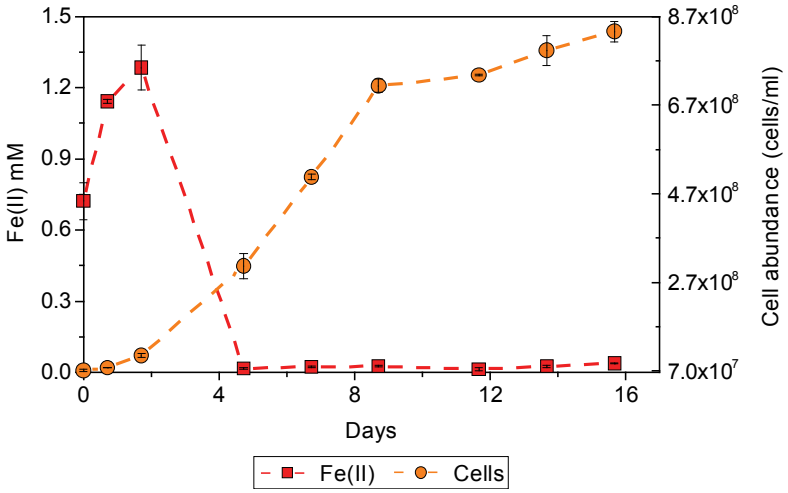

Figure S1. Fe(II) concentration and abundance of *R. ferrooxidans* SW2 cells in growth experiments (20°C, light incubation) using medium that initially contained both Fe(II) and Fe(III) (ca. 0.8 mM each) and 4 mM citrate.

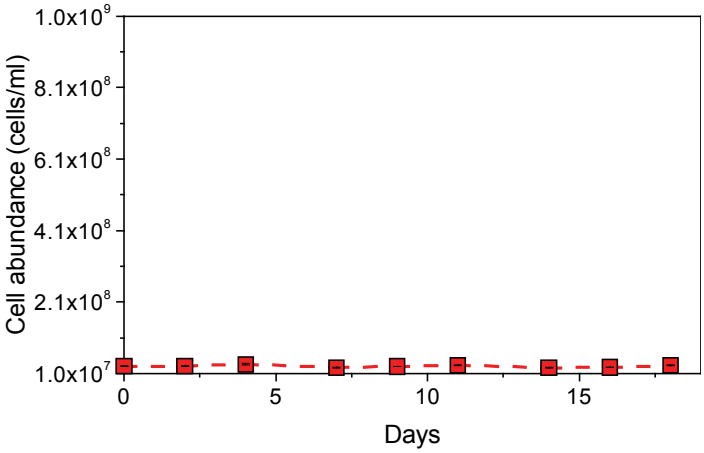

Figure S2. Cell abundance of *R. ferroxidans* SW2 during incubation with 1 mM acetone showing that there was no significant growth of R. ferroxidans SW2 on acetone.

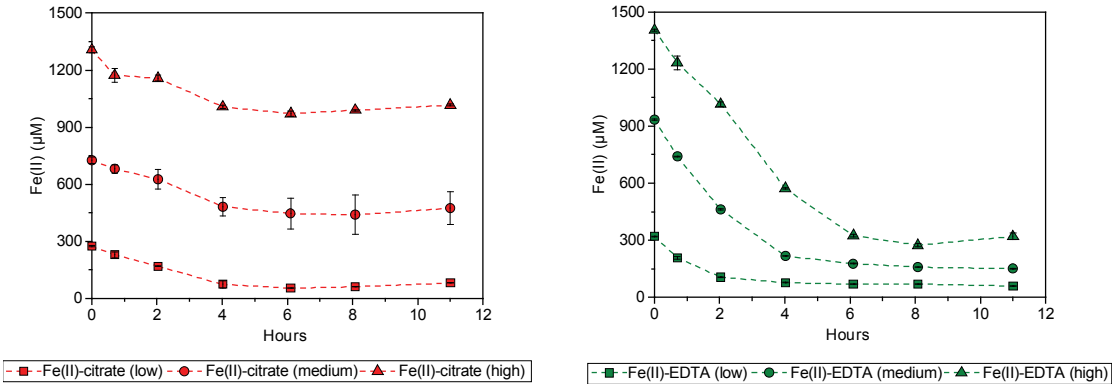

Figure S3. Oxidation of Fe(II)-citrate (left) and Fe(II)-EDTA (right) at three different Fe(II)-complex concentrations by *R. ferrooxidans* SW2 ($1.4x10^8$ cells/ml). The initial Fe(II) concentrations varied from ca. 300 µM to 1300 µM. The results are reported as an average and error bars indicate standard errors calculated from two independent parallels.

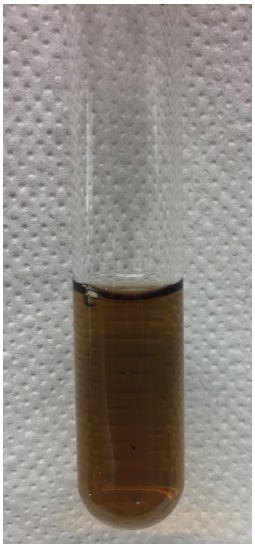

Figure S4. Fe(II)-PPHA complexes (0.1 mM Fe(II) and 0.2 mg/ml PPHA) in Hungate tubes. The PPHA has a dark color and absorbs light thus lowering the light intensity available for the phototrophic microorganisms.

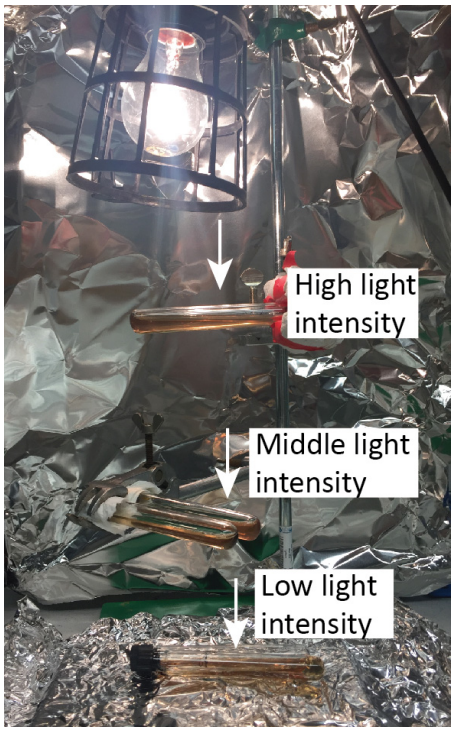

Figure S5. Photograph of an experiment to determine how light intensity influences the oxidation of Fe(II)-PPHA complexes by *R. ferrooxidans* SW2.

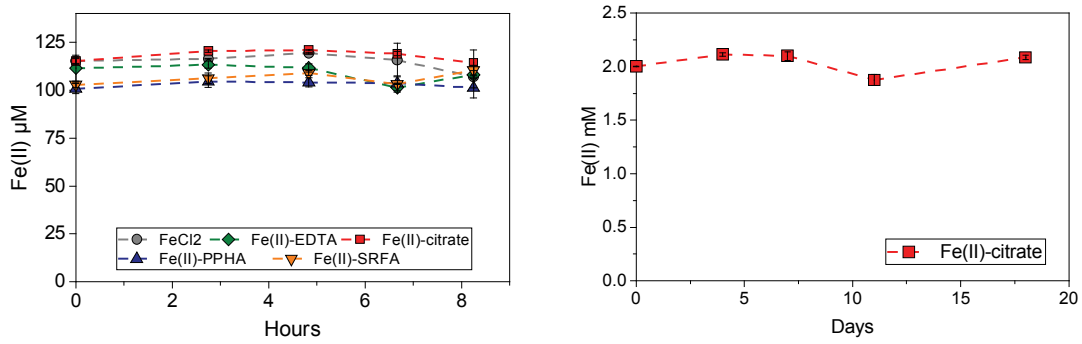

Figure S6. Abiotic controls with different Fe(II)-OM complexes (without *R. ferrooxidans* SW2 cells but incubated in the light). Error bars indicate standard errors calculated from two independent parallels. The result showed that there was no Fe(II) oxidation in the abiotic controls. Left: abiotic controls in cell suspension experiments with $FeCl_2$, Fe(II)-EDTA, Fe(II)-citrate, Fe(II)-PPHA, and Fe(II)-SRFA. Right: abiotic control with Fe(II) citrate in a cell growth experiment.