

## **Supplementary Material for:**

# **Interaction of Silica Nanoparticles with Microalgal Extracellular Polymers**

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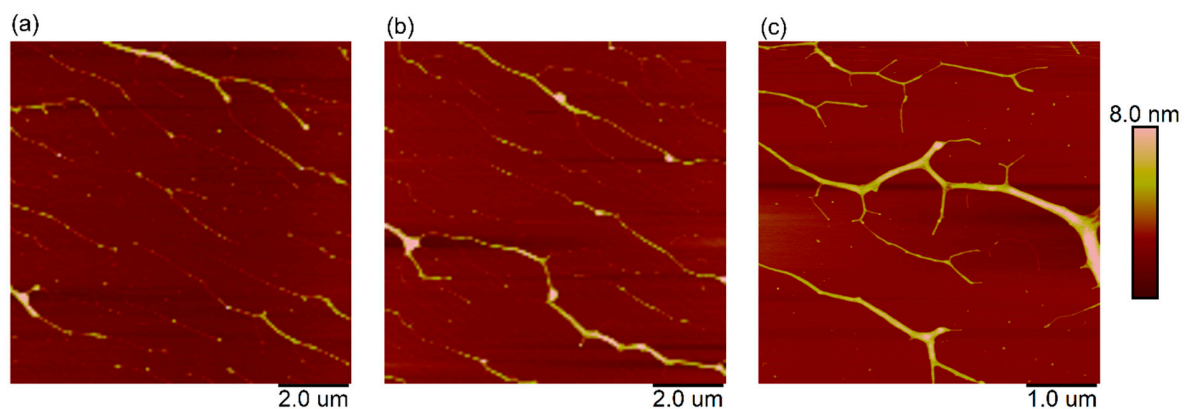
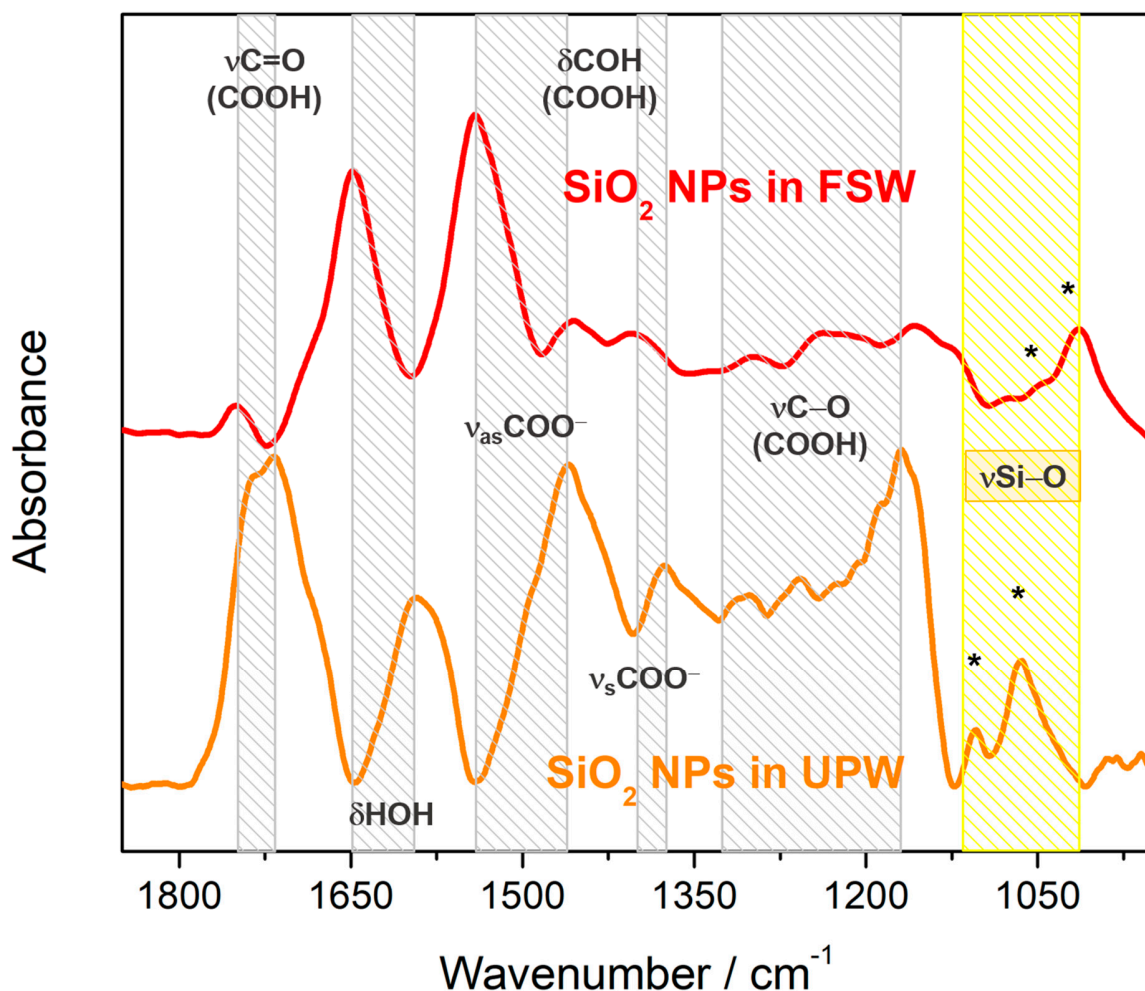


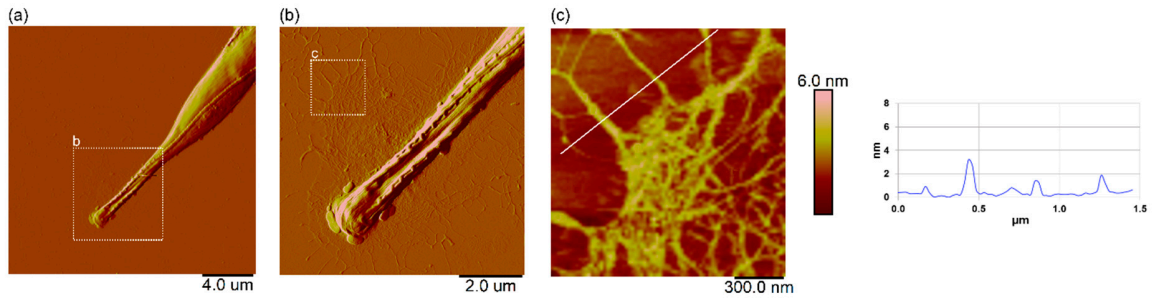
Figure S1: AFM images of extracellular polymers (EPS,  $100 \mu\text{g mL}^{-1}$ ) isolated from *Cylindrotheca closterium* culture, prepared in natural filtered seawater. Images were acquired using tapping mode in air and presented as height with scan sizes  $10 \mu\text{m} \times 10 \mu\text{m}$  (a, b) and  $5 \mu\text{m} \times 5 \mu\text{m}$  (c), vertical scale 8 nm.



**Figure S2.** The comparison of FTIR spectra of SiO<sub>2</sub> NPs in SW and UPW. FTIR spectra (1850-950 cm<sup>-1</sup>) of SiO<sub>2</sub> NPs dissolved in FSW (red curve) and UPW (orange curve). The displacement of distinguished bands is highlighted using gray or yellow rectangles.

The impact of FSW and UPW on FTIR spectra of SiO<sub>2</sub> NPs dissolved in a different medium (composition, pH, ionic strength etc.) is demonstrated in Figure S1. Expectedly, the bands originated from vibrational motion of (de)protonated carboxylic groups ( $\nu\text{C}=\text{O}$ ,  $\nu\text{C}-\text{O}$ ,  $\delta\text{COH}$ ,  $\nu_{\text{as}}\text{COO}^-$ ), residual water ( $\delta\text{HOH}$ ) and Si-O moieties are displaced in these two aqueous media. However, the closer inspection of the yellow-highlighted region suggests that  $\nu\text{Si}-\text{O}$  signature maintain the band shape, regardless to the displacement of the corresponding maxima (\*-labeled) that appear at 1014 cm<sup>-1</sup> and 1051 cm<sup>-1</sup> in SW and at 1065 cm<sup>-1</sup> and 1103 cm<sup>-1</sup> in UPW, respectively (Capelletti et al. 2016).

Capelletti, L.B.; Zimnoch, J.H.; Capeletti, L.B.; Zimnoch, J.H. *Fourier Transform Infrared and Raman Characterization of Silica-Based Materials*; IntechOpen: Rijeka, Croatia, 2016; ISBN 978-953-51-2681-2.



**Figure S3.** AFM images of *Cylindrotheca closterium* cell (**a**, **b**) with released EPS (**c**) from control culture (culture not spiked with SiO<sub>2</sub> NPs). Images are acquired using contact mode in air with scan sizes: 20  $\mu\text{m} \times 20 \mu\text{m}$  (**a**), 8  $\mu\text{m} \times 8 \mu\text{m}$  (**b**), 1.5  $\mu\text{m} \times 1.5 \mu\text{m}$  (**c**) and presented as deflection (**a**, **b**) and height data (**c**). Vertical profile along indicated line shows heights of EPS fibrils.