

SUPPLEMENTARY MATERIAL

Electrophoresis as a simple method to detect deleterious actions of engineered nanoparticles on living cells

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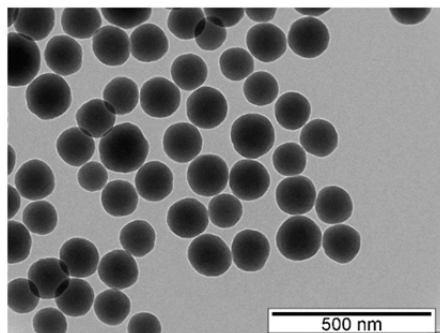


Figure S1: TEM picture of SiNH₂ NPs.

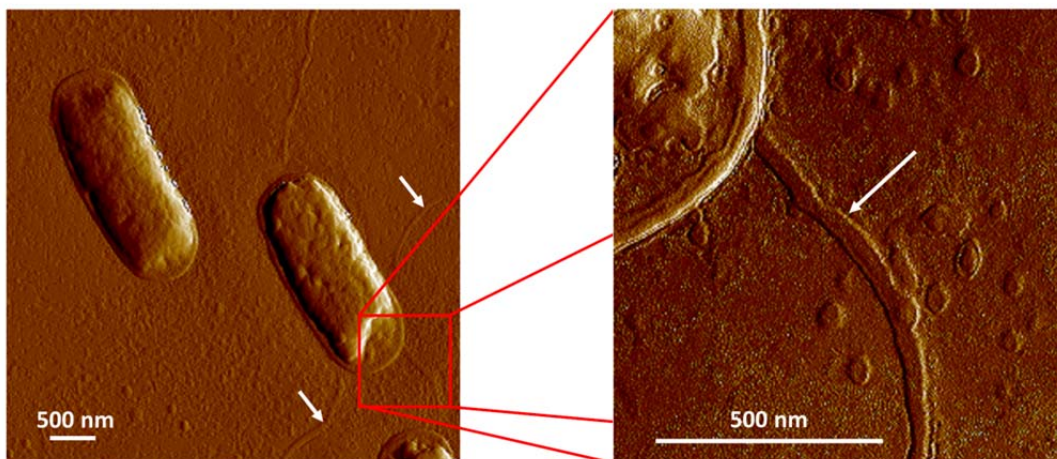


Figure S2: AFM peak force error images, taken in air, for F-pili (E2302) bacteria at pH 7. The image on the right is a $\times 5$ zoom of the left image. White arrows correspond to F-pili.

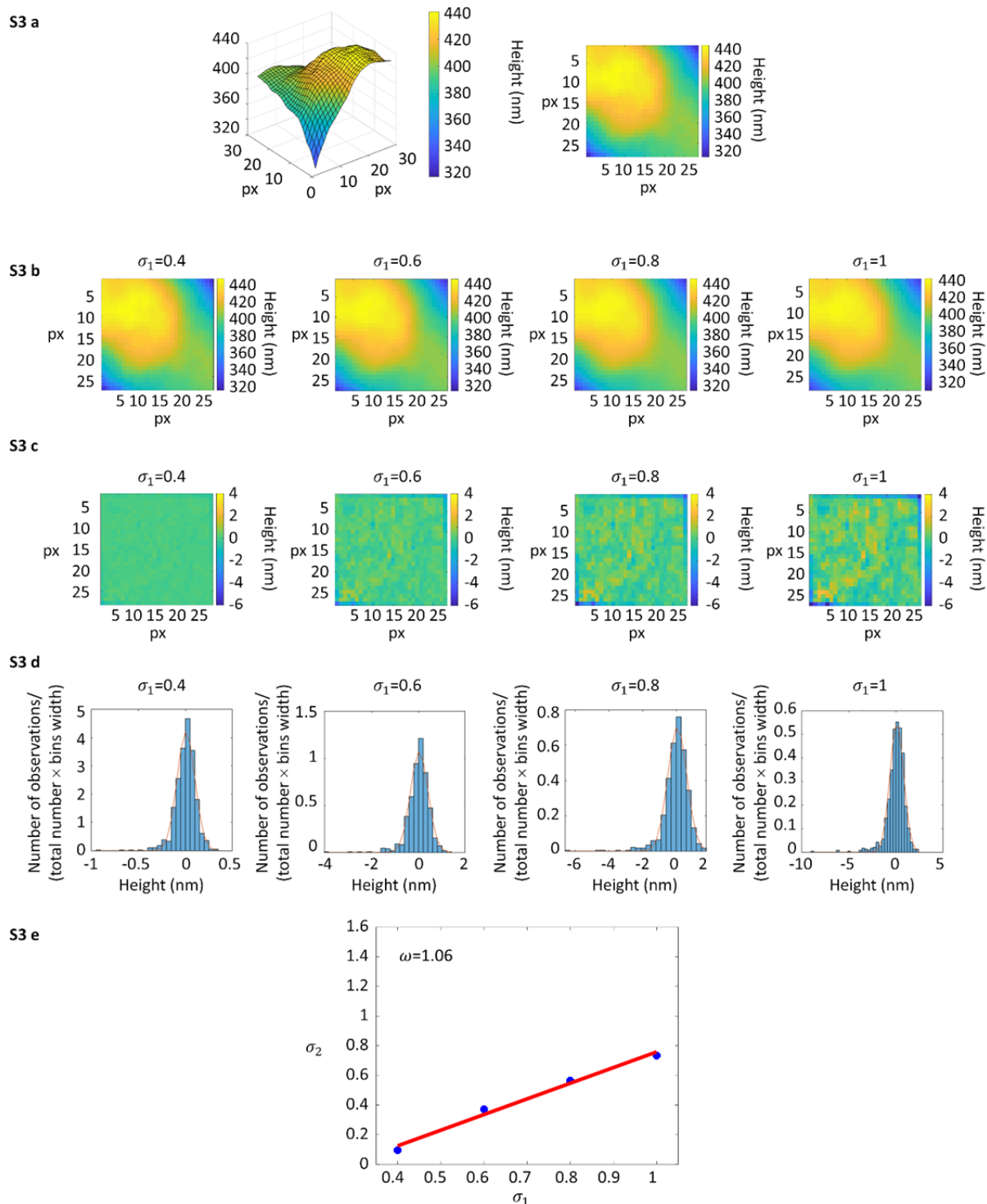
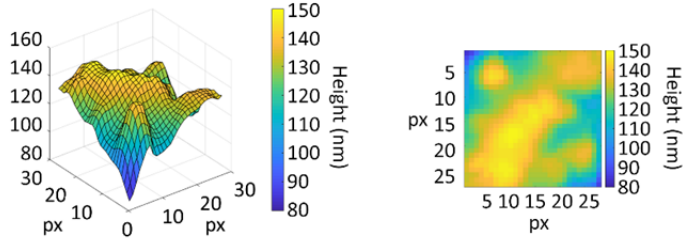


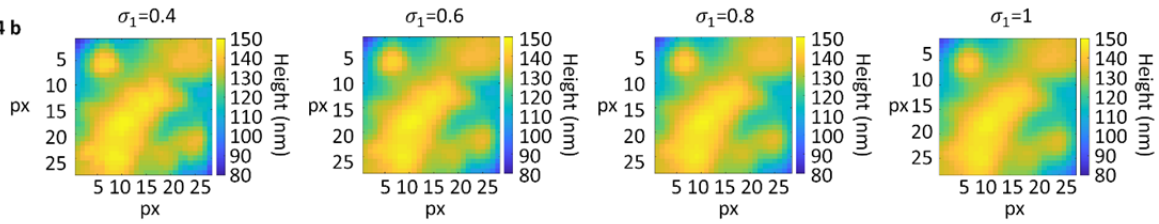
Figure S3: Illustration of the various steps followed for evaluation of cells surface roughness. The given example pertains to YeeJ (E2551) strain images at pH 7 in the absence of NPs (1 mM solution ionic strength). a: raw image in 3D (left) and 2D (right) (400 nm \times 400 nm, 28 pixels \times 28 pixels) taken from 3.5 μ m \times 3.5 μ m, 256 pixels \times 256 pixels AFM images (obtained under liquid conditions). b: images after application of a Gaussian filter defined by $\sigma_1=0.4, 0.6, 0.8, 1$ (indicated). c: images obtained after

subtraction of the Gaussian-filtered images from the raw images at $\sigma_1=0.4, 0.6, 0.8, 1$ (indicated). **d**: distributions (given in the form of histograms) of the heights derived from images after subtraction at $\sigma_1=0.4, 0.6, 0.8, 1$ (indicated). Red curves: corresponding fits to normal distribution law (standard deviation σ_2). **e**: illustrative linear dependence of σ_2 versus σ_1 (slope ω). 'px' stands for pixels.

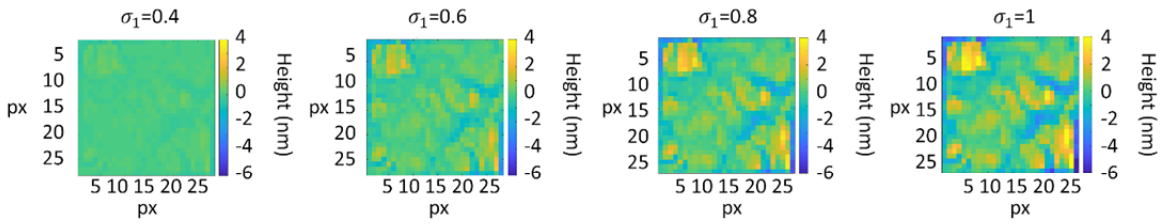
S4 a



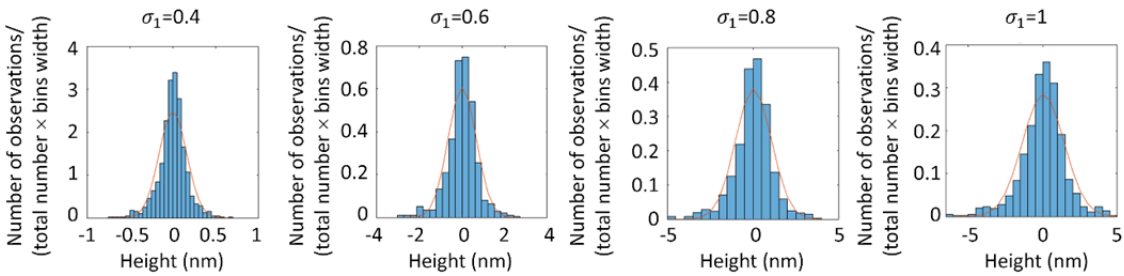
S4 b



S4 c



S4 d



S4 e

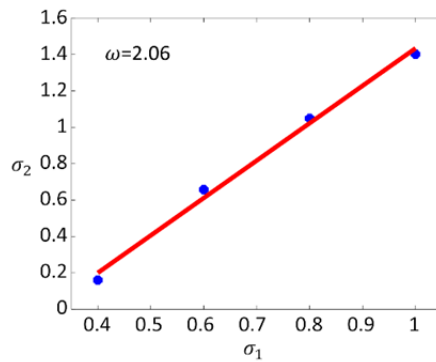


Figure S4: As in Figure S3, for the nude (E2152) strain imaged in the presence of SiNH₂ NPs (10⁻³ g L⁻¹) at pH 3 (2 mM solution ionic strength).

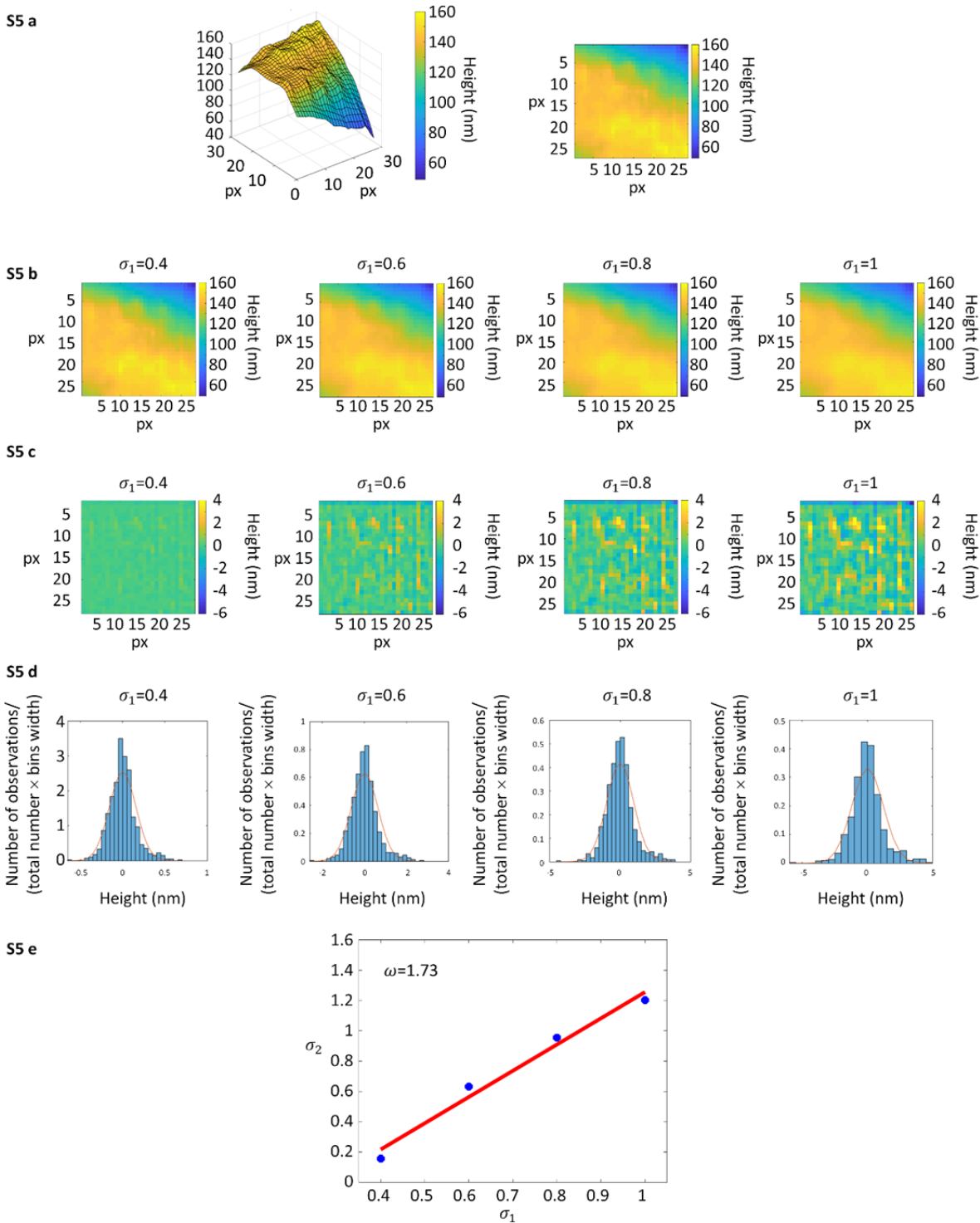


Figure S5: As in Figure S3, for the F-pili (E2302) strain imaged in the presence of SiNH₂ NPs (10⁻³ g L⁻¹) at pH 3 (2 mM solution ionic strength).