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Supplemental information

Resolving physical interactions between bacteria and nanotopographies with focused ion beam scanning electron microscopy

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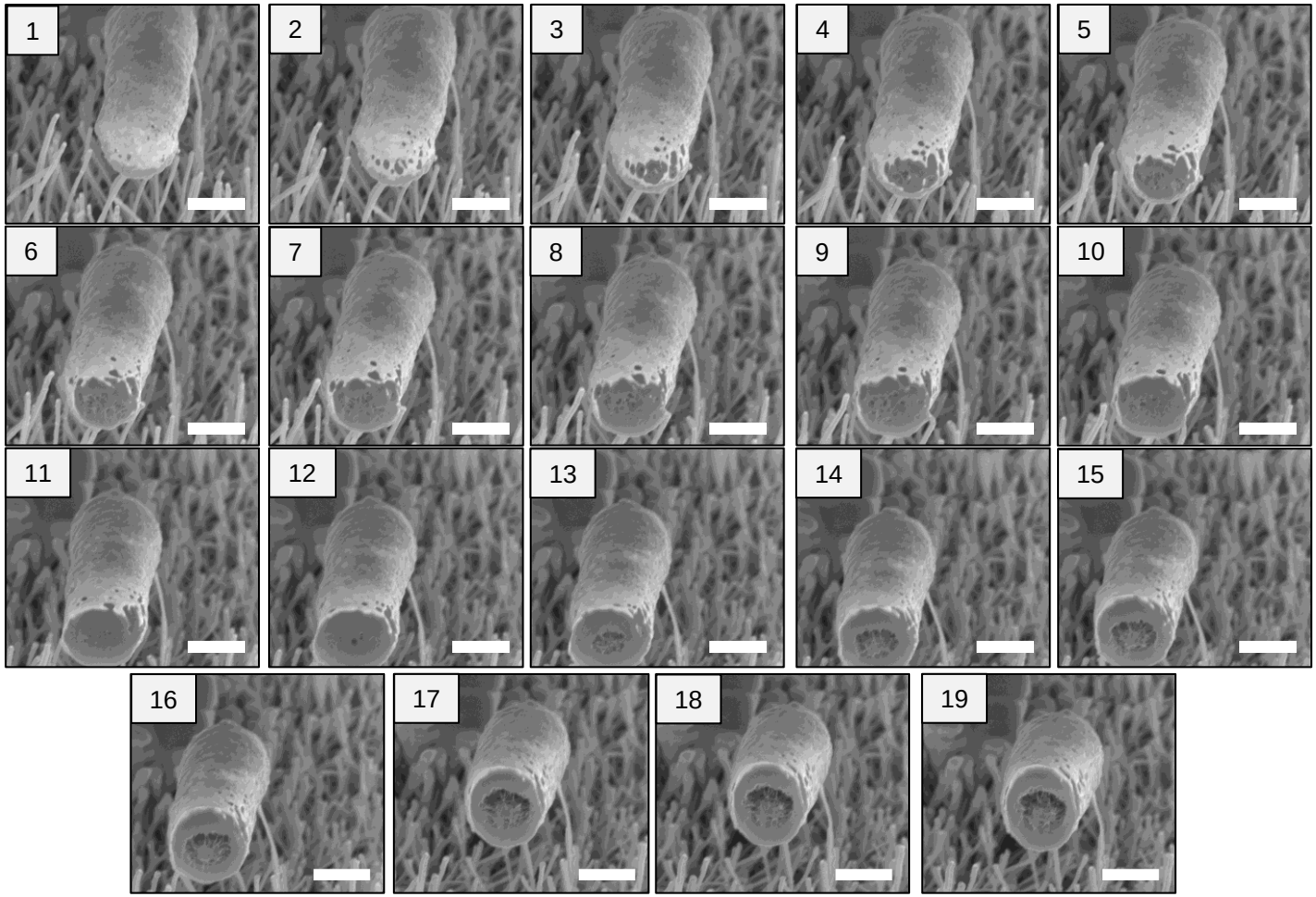
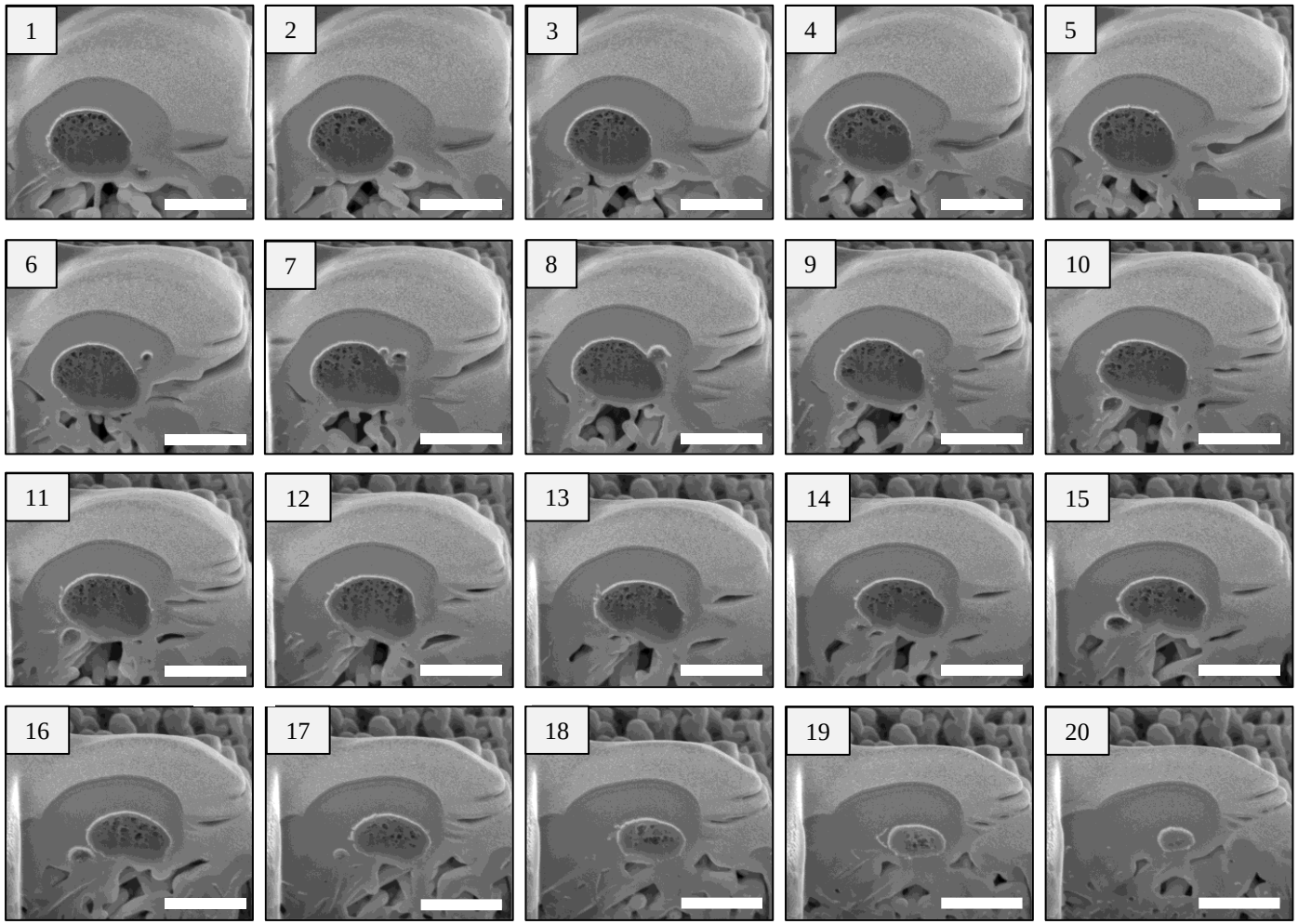
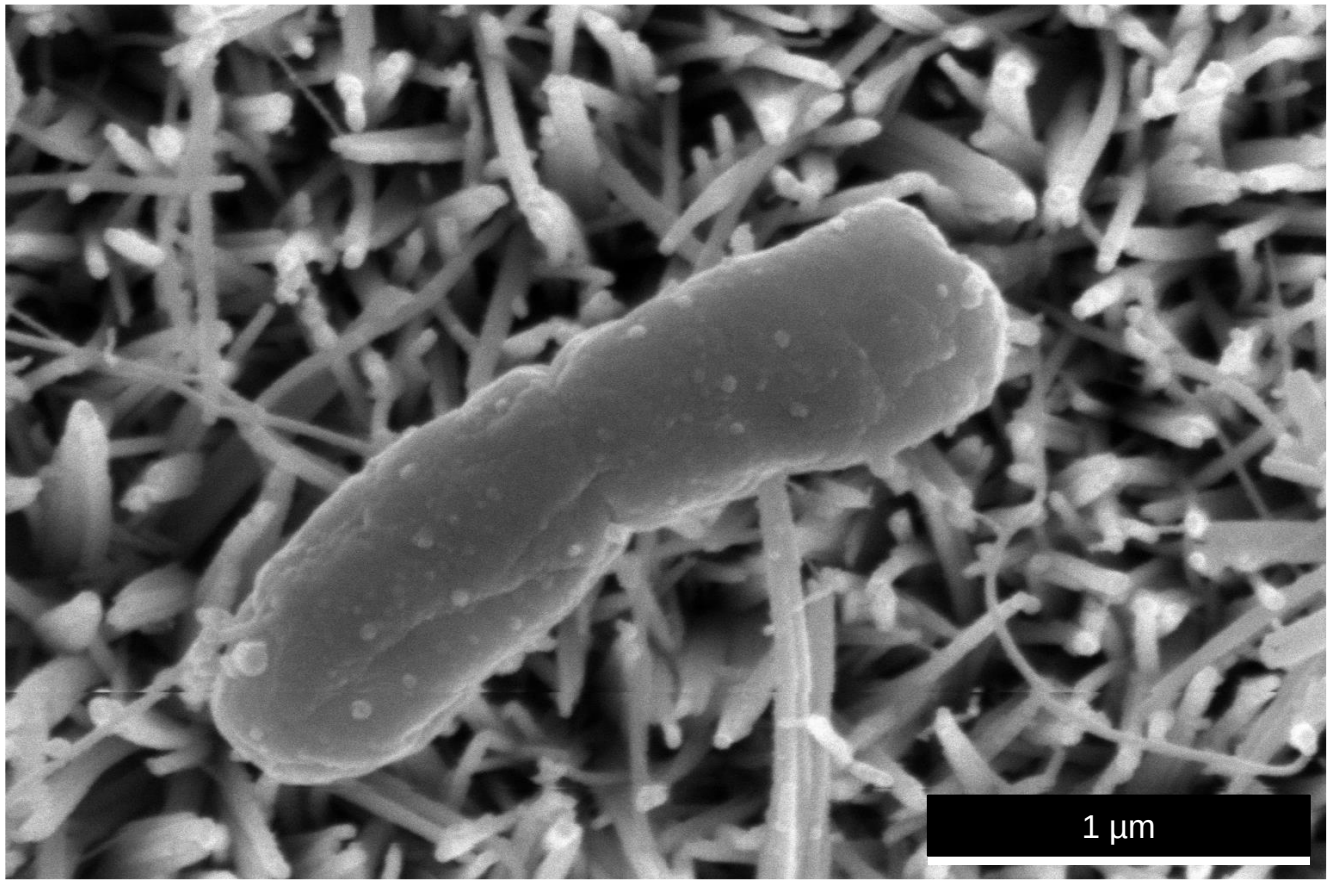


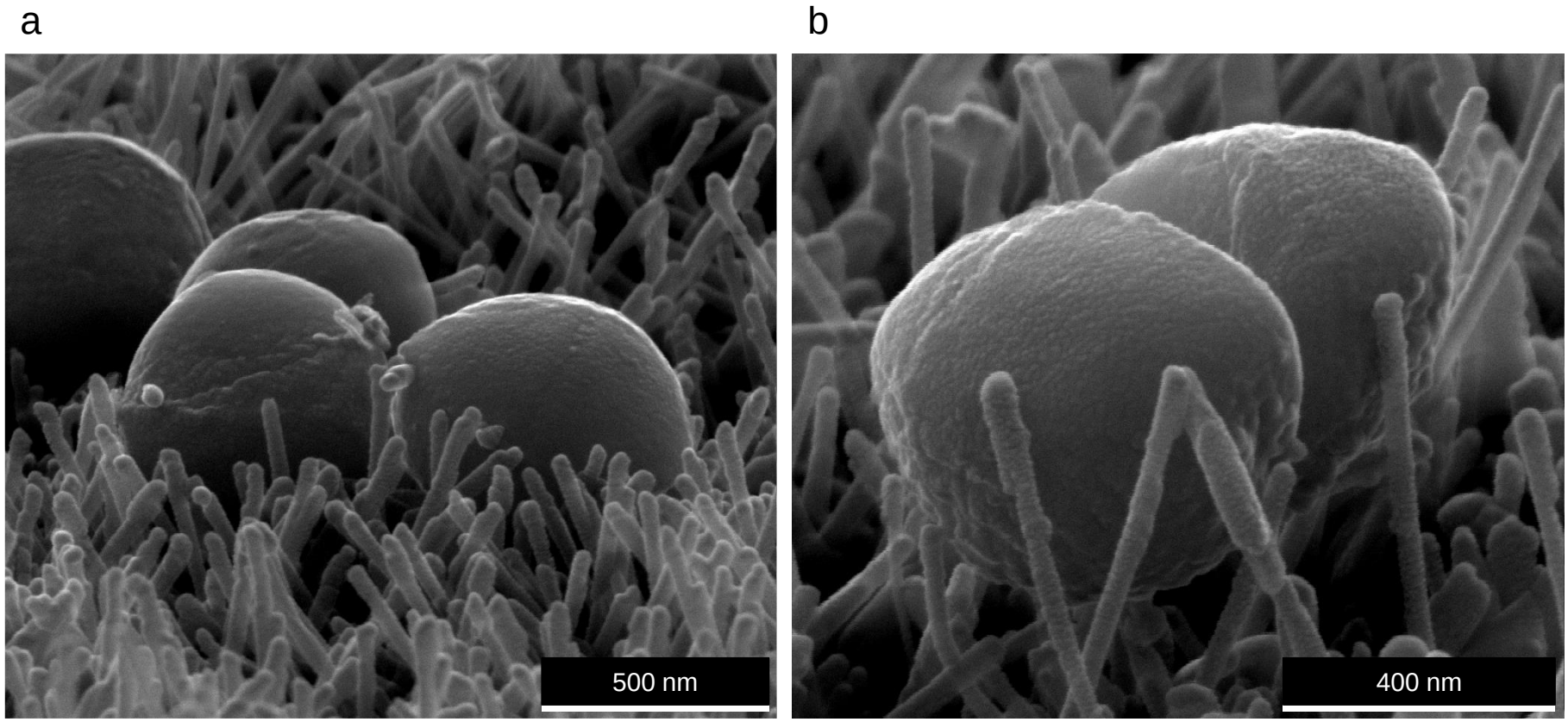
Supplementary Figure 1. Slice and view focused ion beam milling of *E. coli* without platinum deposition. FIB-SEM was used to generate sequential 30 nm cross sections through *E. coli* without a protective platinum coating. The milling interface of 19 serial sections is shown. Scale bar: 500 nm. Related to Figure 2.



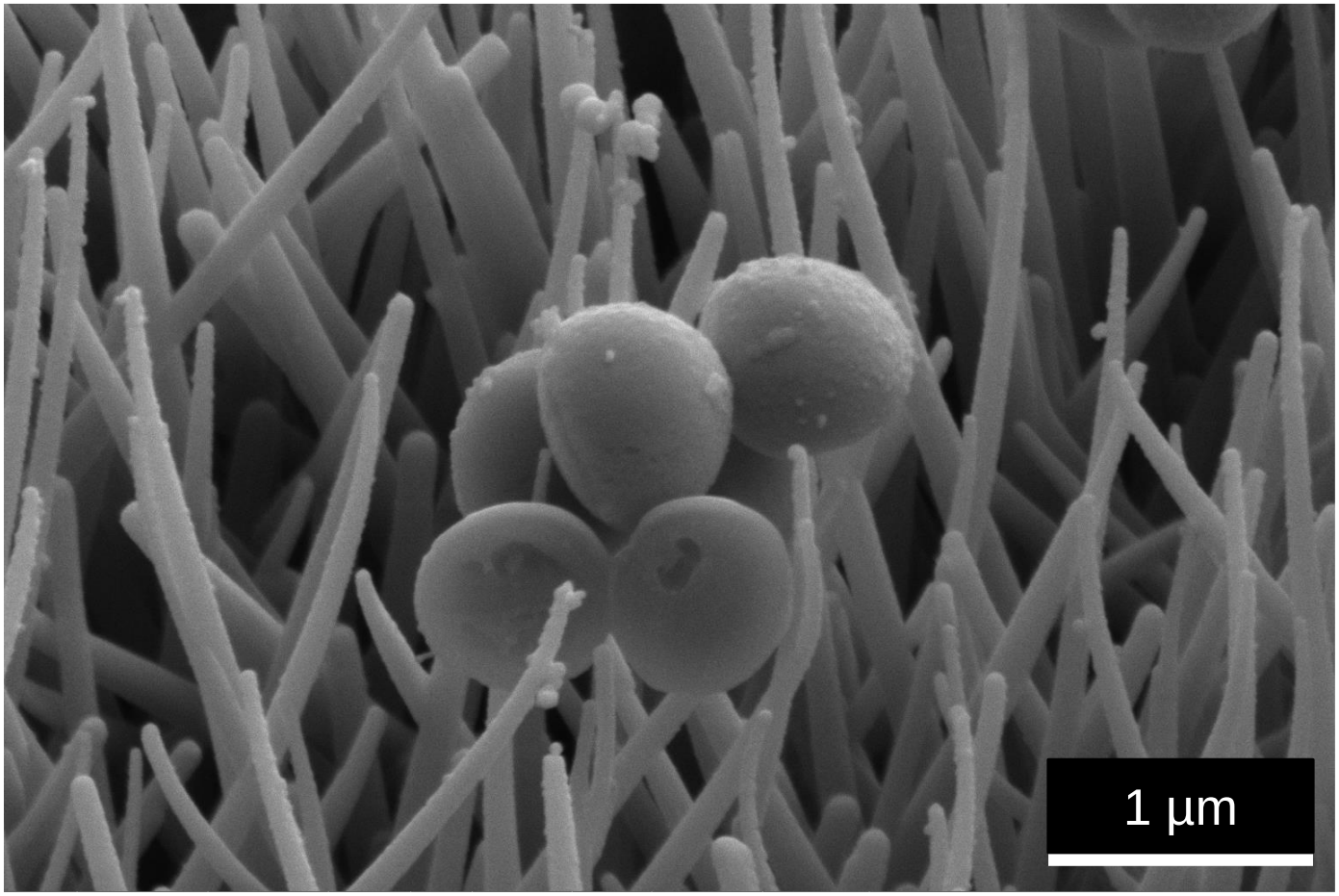
Supplementary Figure 2. Slice and view focused ion beam milling of *E. coli* with platinum deposition. FIB-SEM was used to generate sequential 30 nm cross sections through *E. coli* with a protective platinum coating. The milling interface of 20 serial sections is shown. Scale bar: 500 nm. Related to Figure 2.



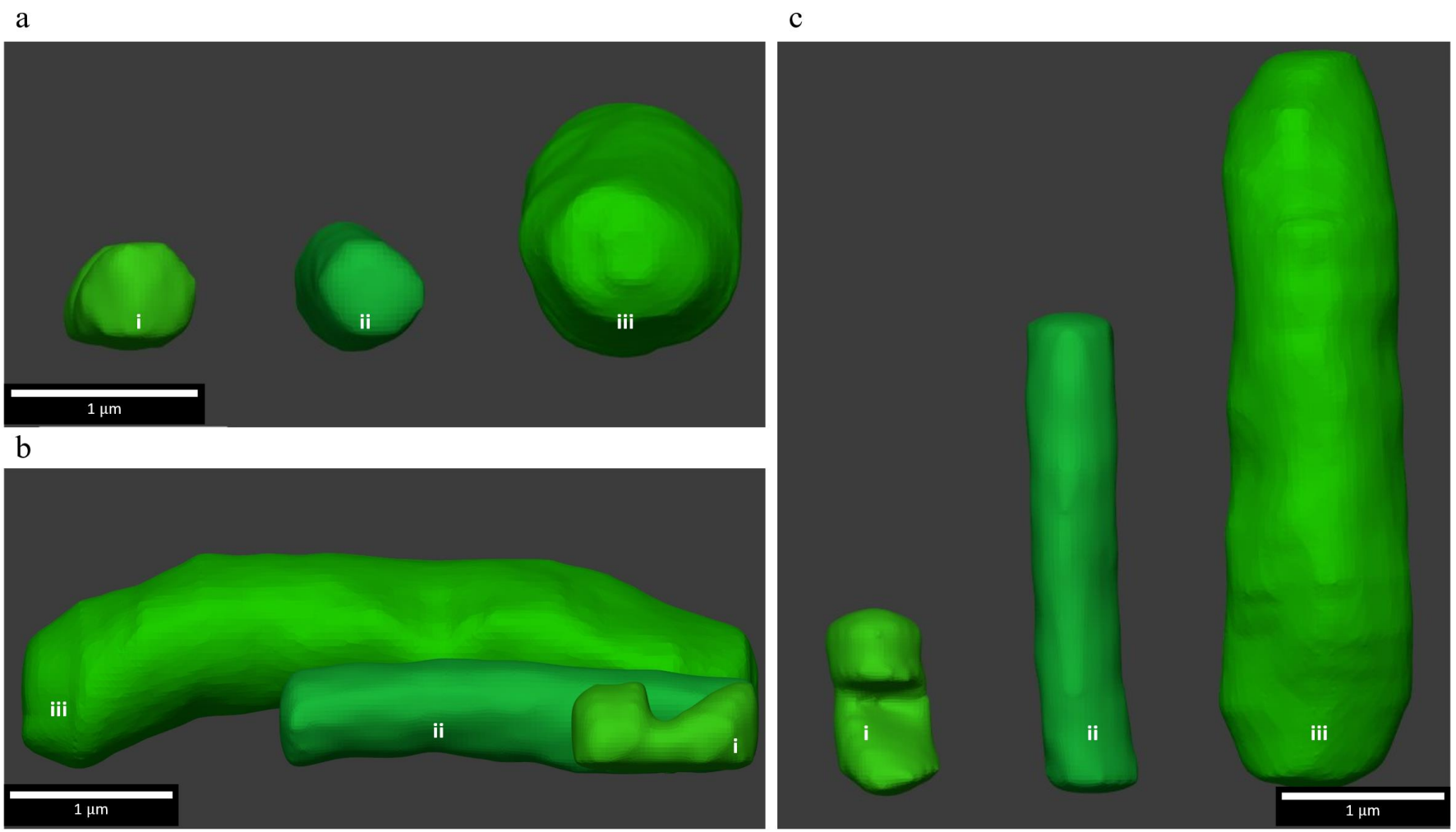
Supplementary Figure 3. *E. coli* envelope deformation induced by AH-NS-Medium surface. No evidence of envelope penetration was observed for *E. coli* on AH-NS-Medium surfaces. However, many *E. coli* cells displayed envelope deformation at the point of nanostructure contact, as represented in this micrograph. Related to Figures 3, 4 and 5.



Supplementary Figure 4. *S. aureus* cell impedance induced by TO-NS-Short surface. Representative scanning electron micrographs of *S. aureus* cells impeded by TiO_2 nanostructures on TO-NS-Short surfaces (a-b). The random growth direction of TiO_2 nanostructures on TO-NS-Short surfaces generates variation in nanostructure density across the surface, meaning that some *S. aureus* cells adhere between nanostructures that are spaced greater than 500 nm apart. Related to Figure 6.



Supplementary Figure 5. Evidence for *S. aureus* cell impedance induced by TO-NS-Long surface. Representative scanning electron micrographs of *S. aureus* impeded by TiO_2 nanostructures on TO-NS-Long surfaces. Cross sections through *S. aureus* cells show no evidence of envelope deformation or penetration, but clearly show that *S. aureus* cells have adhered between the nanostructures. Related to Figures 8-9.



Supplementary Figure 6. **Size comparison of *E. coli* cells adhered to different nanostructured surfaces.** Size comparison of three different *E. coli* cells adhered on (i) PE-NS-Short surface, (ii) TO-NS-Short surface and (iii) TO-NS-Long surface. (a) Front view, (b) side view, (c) top view. Related to Figures 6-8.