Electronic Supplementary Material (ESI) for Soft Matter.

Bacterial nanotubes mediate the bacterial growth on the periodic nano-pillars

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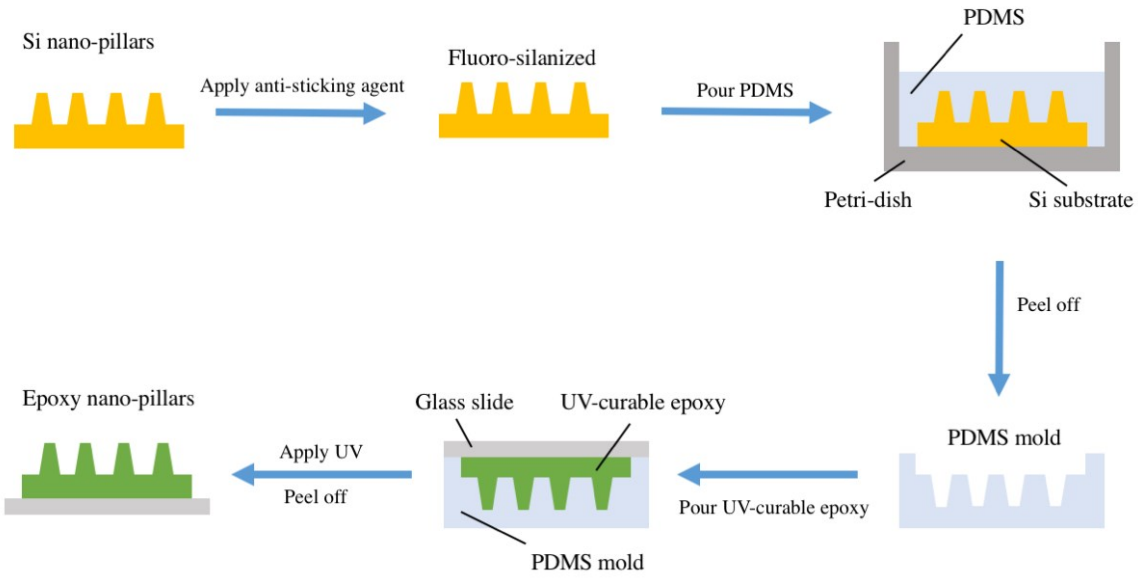

Figure S1. A schematic of the double moulding procedure for creating epoxy replicas of nano-pillars.

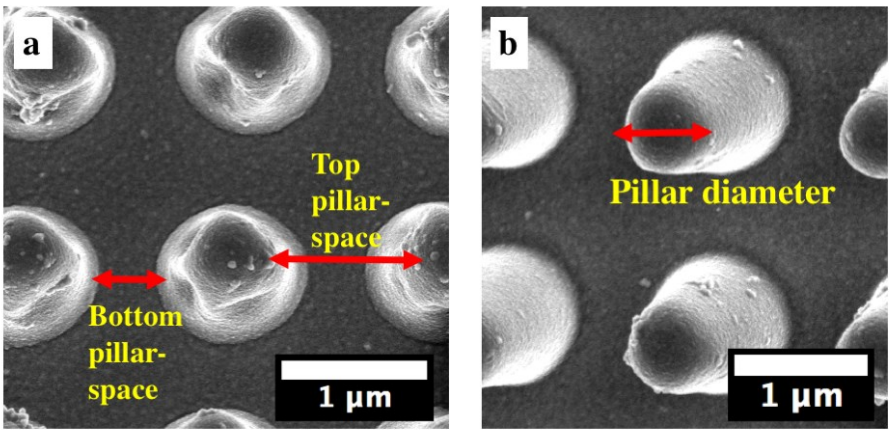

Figure S2. Representative SEM images of nano-pillars with a top space of 1 µm. Notably, the shape of pillar was trapezoidal owing to the etching process and the diameter of pillar increases from 500 nm (top) to 1 µm (bottom). Therefore, the bottom pillar space is around 500 nm for nano-pillars with a top space of 1 µm. To clarify, we defined the pillar diameter and space between pillars only based on the top of pillars in this study, unless specifically noted.

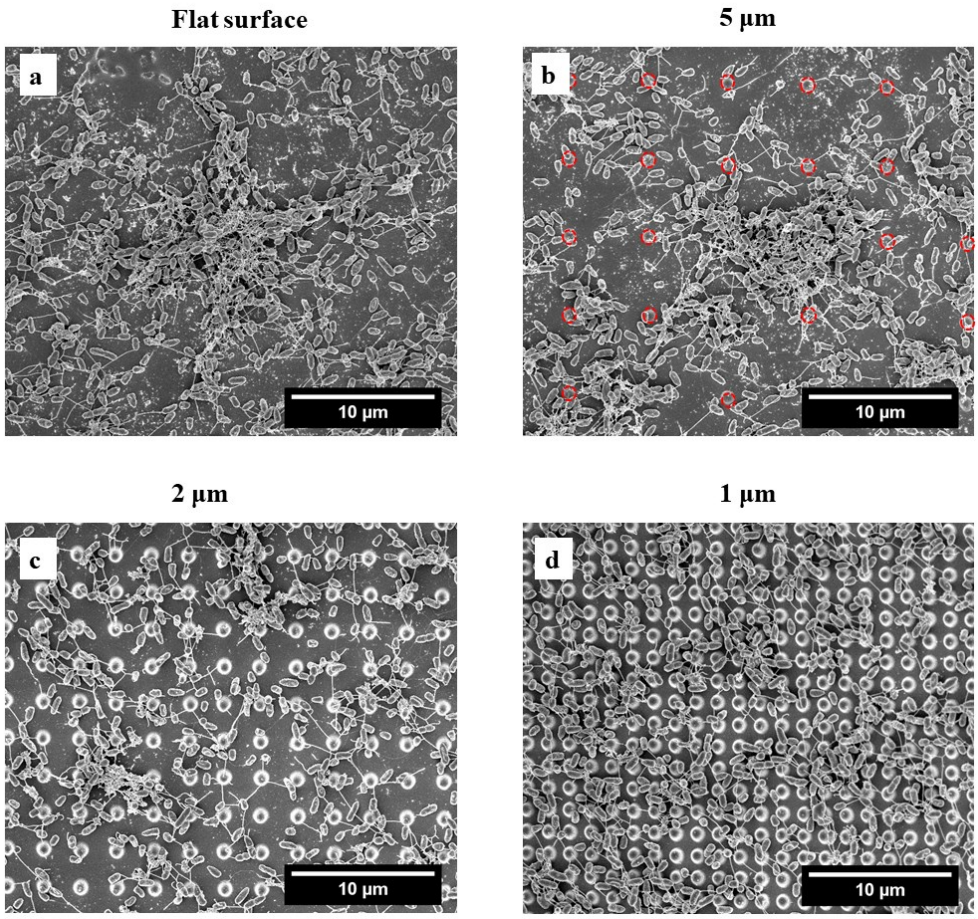

Figure S3. SEM images of *P. aeruginosa* PAO1-mCherry 24h-biofilms visualized at the magnification of 8000×. The red circles in image 2 indicated the nano-pillars.

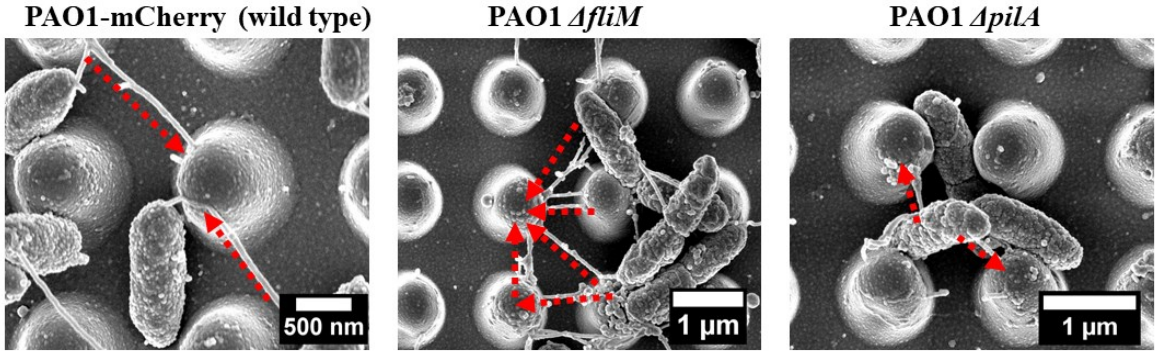

Figure S4. SEM images of the nanotube networks of *P. aeruginosa* PAO1-mCherry (wild-type), PAO1 *ΔfliM* and PAO1 *ΔpilA* after 24 hours. The red arrows indicate the nanotube connect the neighboring nano-pillars to form web-like networks.

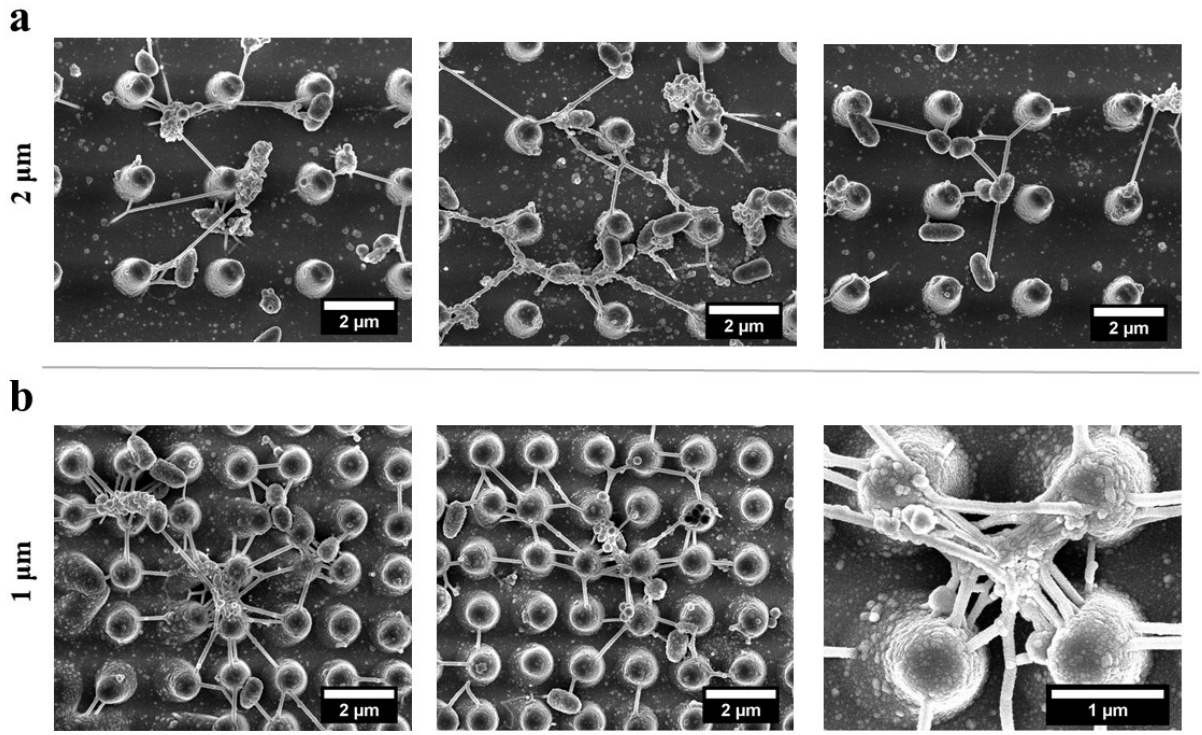

Figure S5. SEM images of the nanotube networks of the attached *P. aeruginosa* PAO1-mCherry cells (after 2 hours) with the further incubation after 24 hours **(a)**: within the nano-pillars of 2 µm space; **(b)**: within the nano-pillars of 1 µm space.

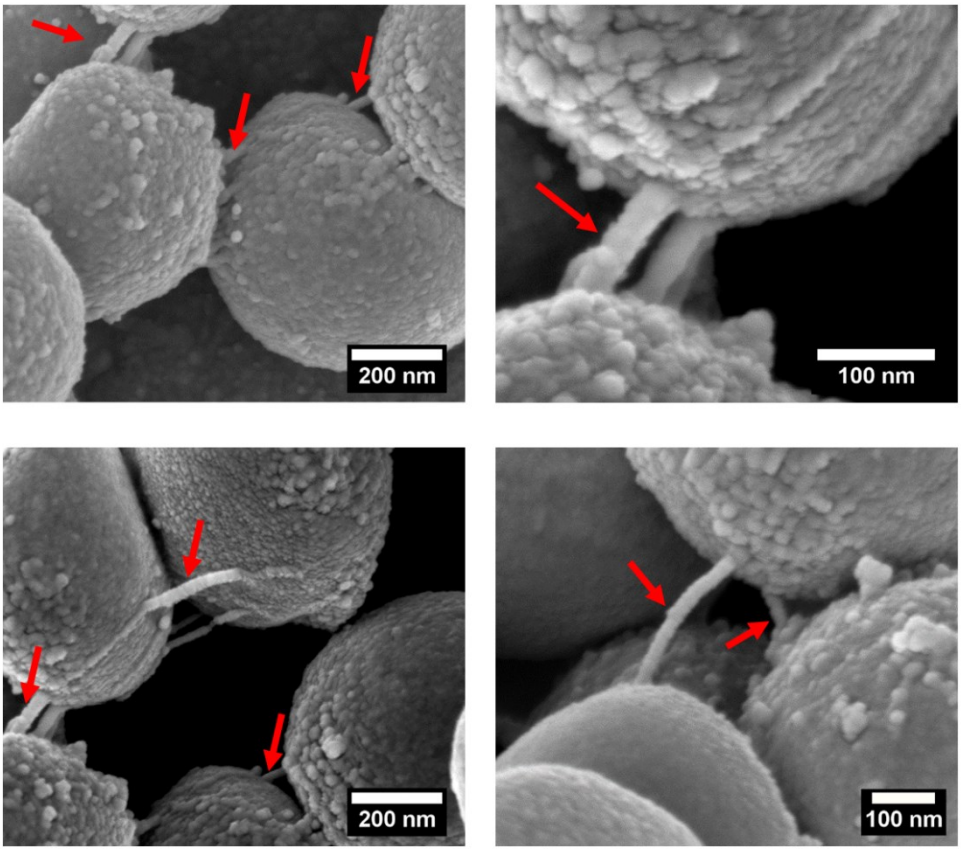

Figure S6. SEM images of *S. epidermidis* cells on ITO-glasses after 2 hours' incubation. Red arrows indicated the bacterial nanotubes for bridging cells.

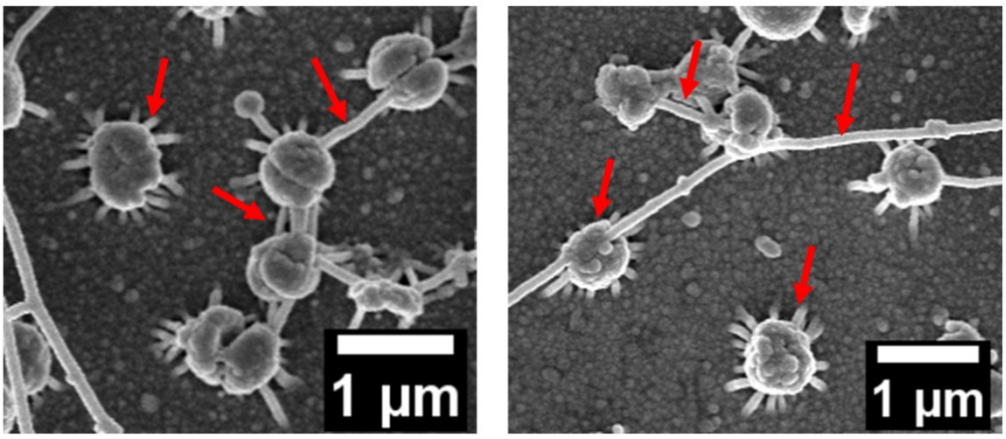

Figure S7. SEM images of *S. epidermidis* cells on epoxy surfaces after 2 hours' incubation. Red arrows indicated the bacterial nanotubes for bridging cells.

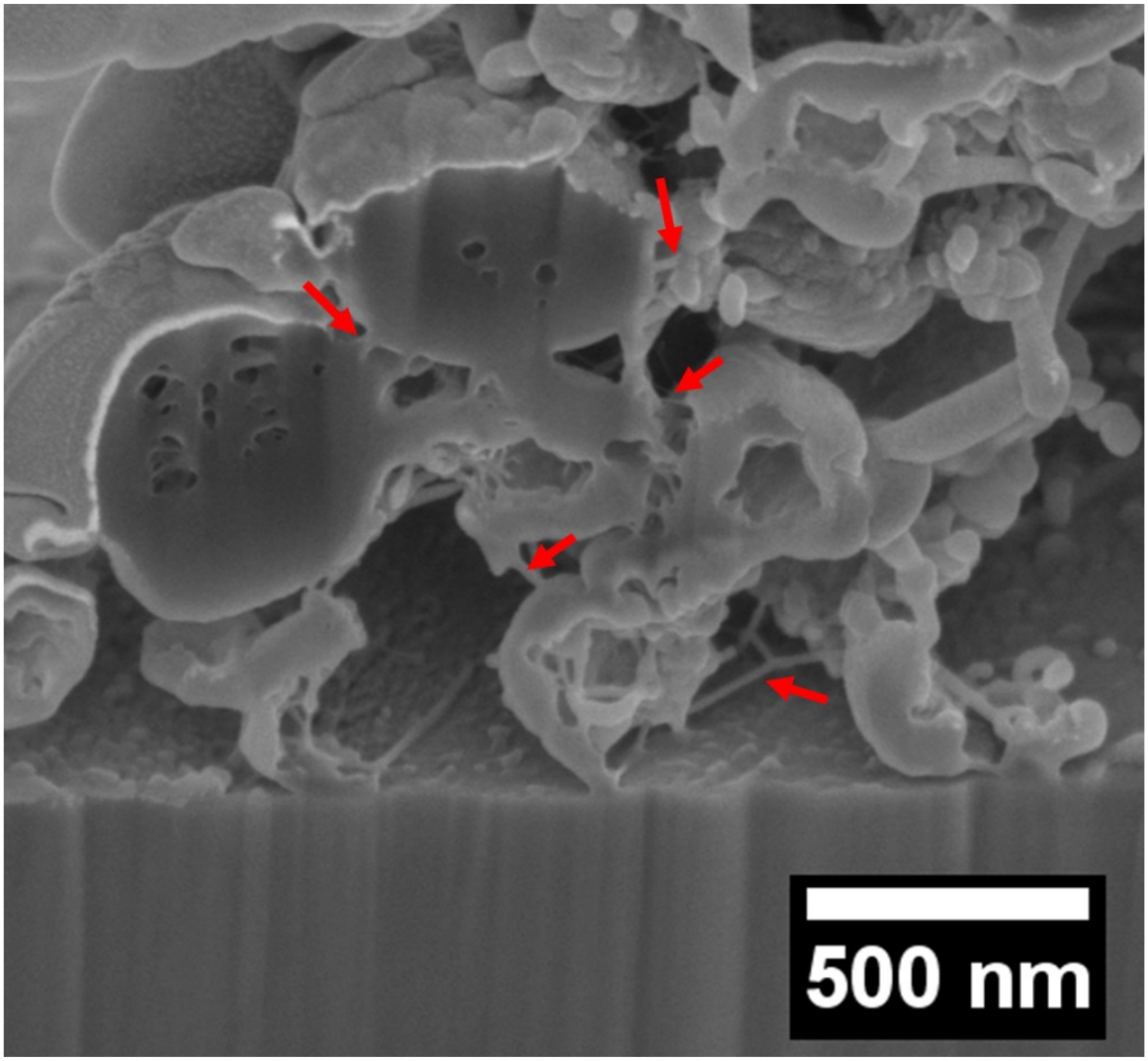

Figure S8. FIB-SEM images of *S. epidermidis* cells on titanium surfaces after 2 hours' incubation. Red arrows indicated the bacterial nanotubes for bridging cells.

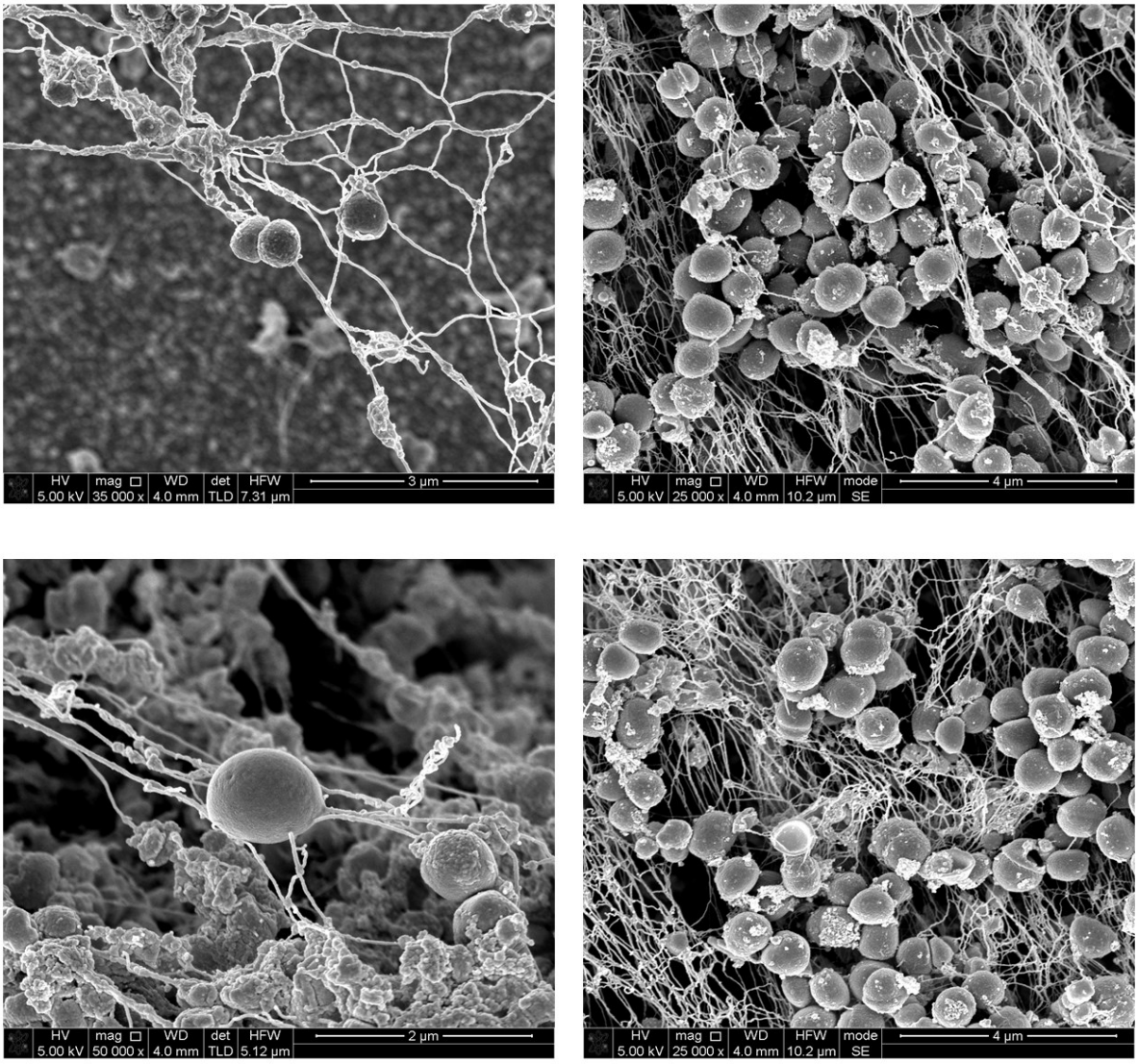

Figure S9. SEM images of *S. epidermidis* biofilms on titanium surfaces after 6 days.