Electronic Supplementary Information

Electrospun poly (lactic acid) fibers containing novel chlorhexidine particles with sustained antibacterial activity

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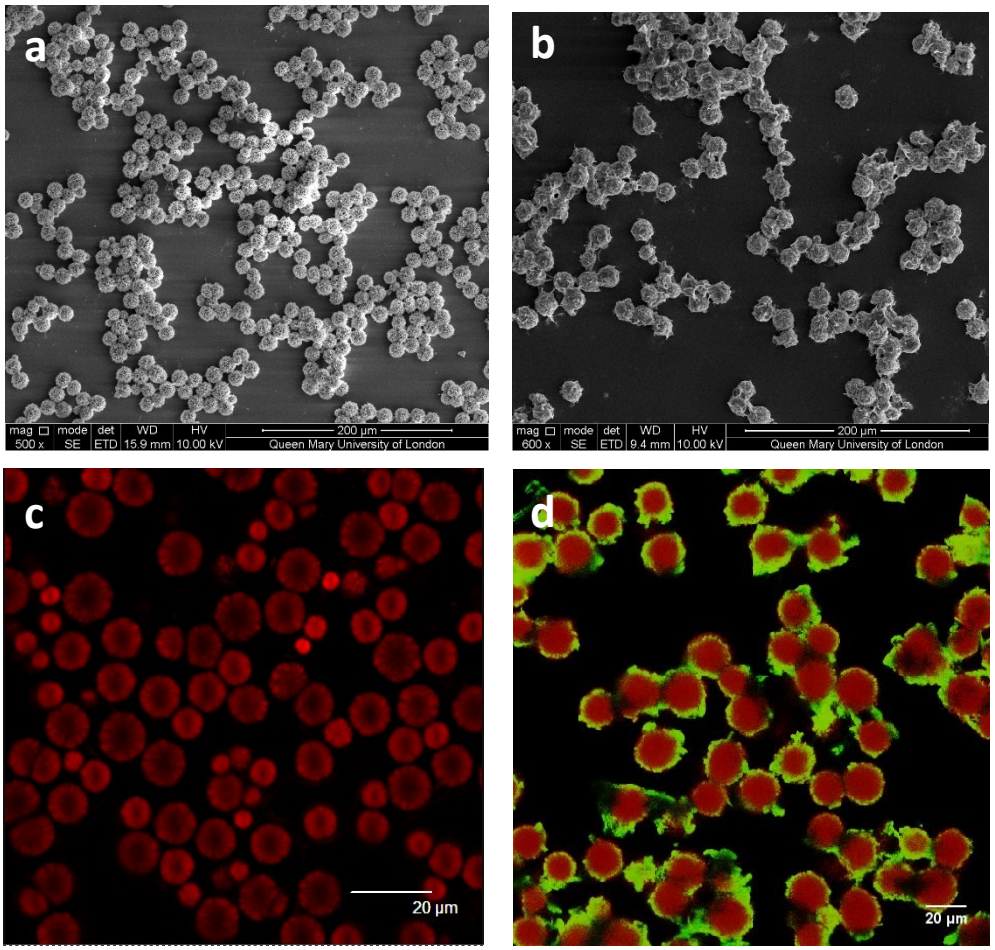
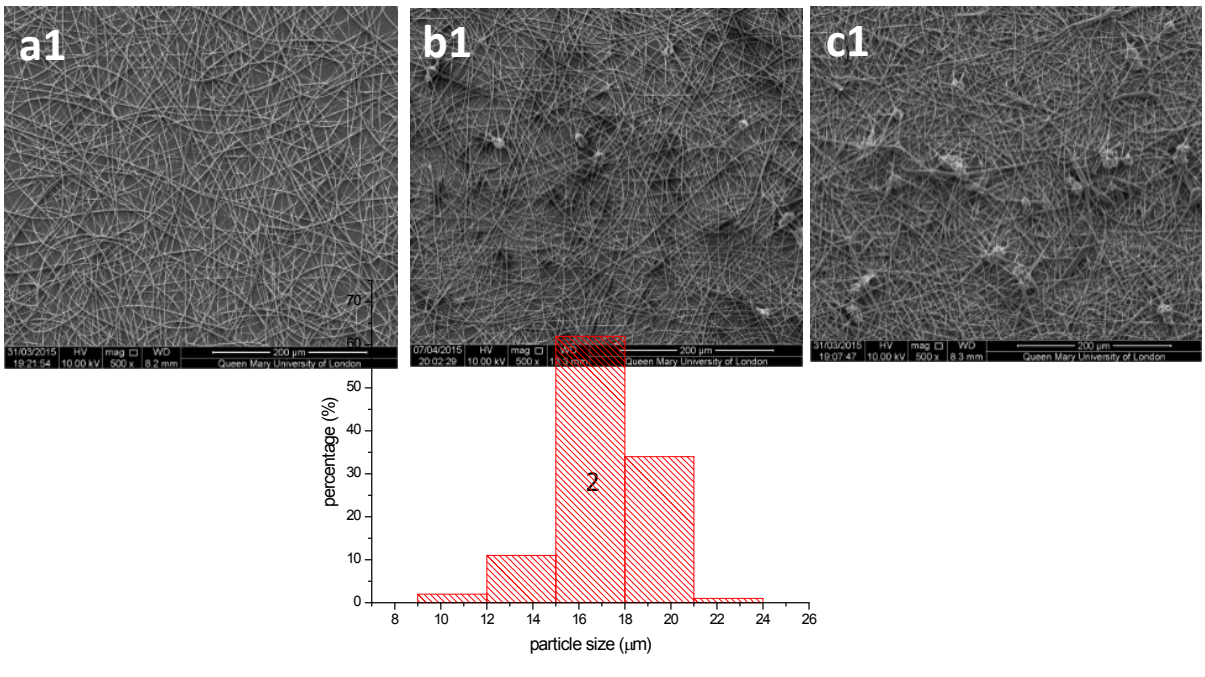


e

Fig. S1. Chlorhexidine particles. SEM images of (a) chlorhexidine particles without coating; (b) chlorhexidine particles which was covered by PAH/PSS shells; confocal images of (c) chlorhexidine particles labelled with RhB; (d) coated chlorhexidine particles with one of the PAH layers labelled with FITC; (e) diameter distribution of the chlorhexidine particles.



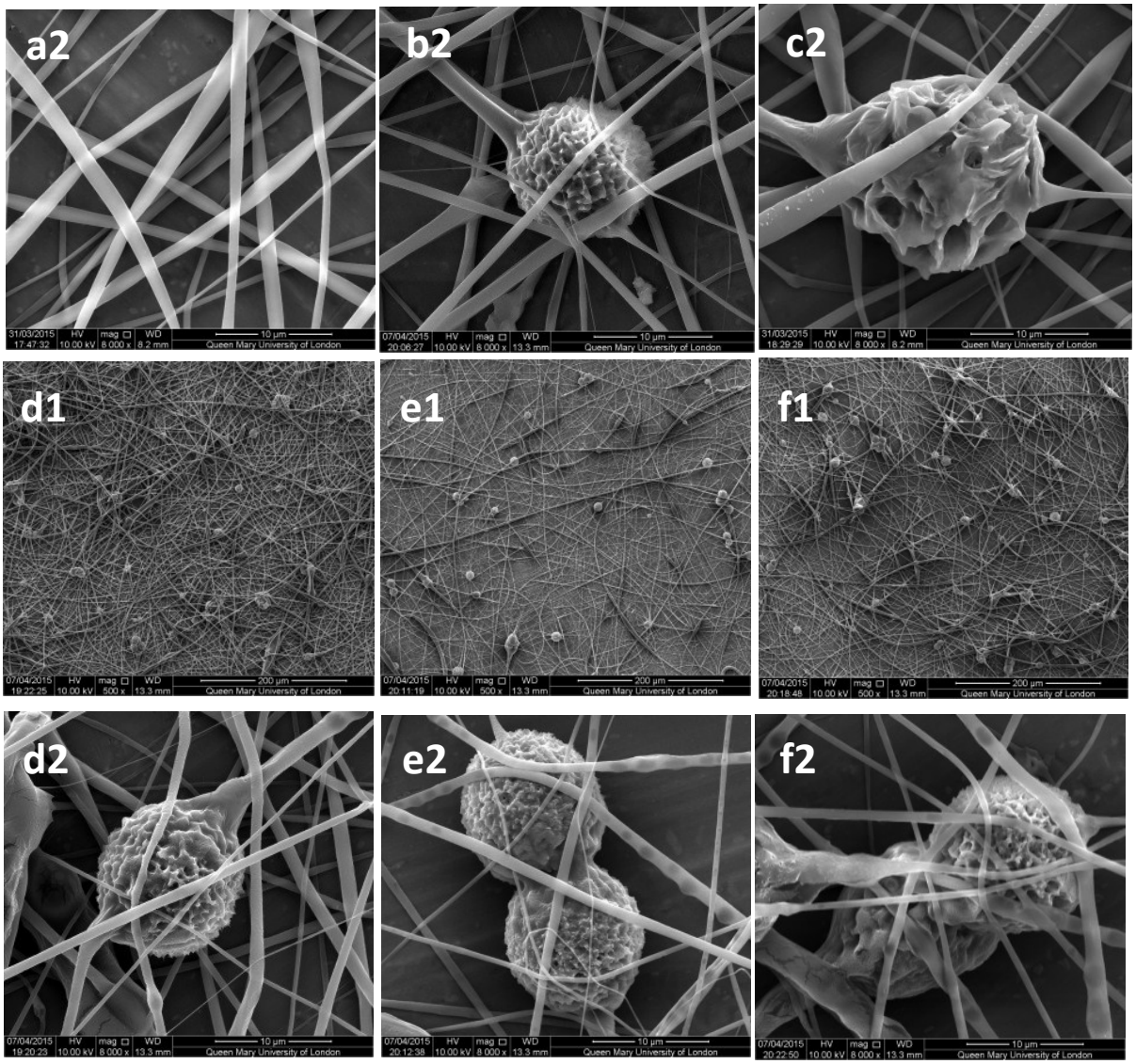


Fig. S2. SEM images of electrospun fibers. (a) PLA fiber control; and PLA fibers containing (b) 5 %; (c) 10 %; (d) 15 %; (e) 20 %; (f) 25 % wt/wt chlorhexidine particles.

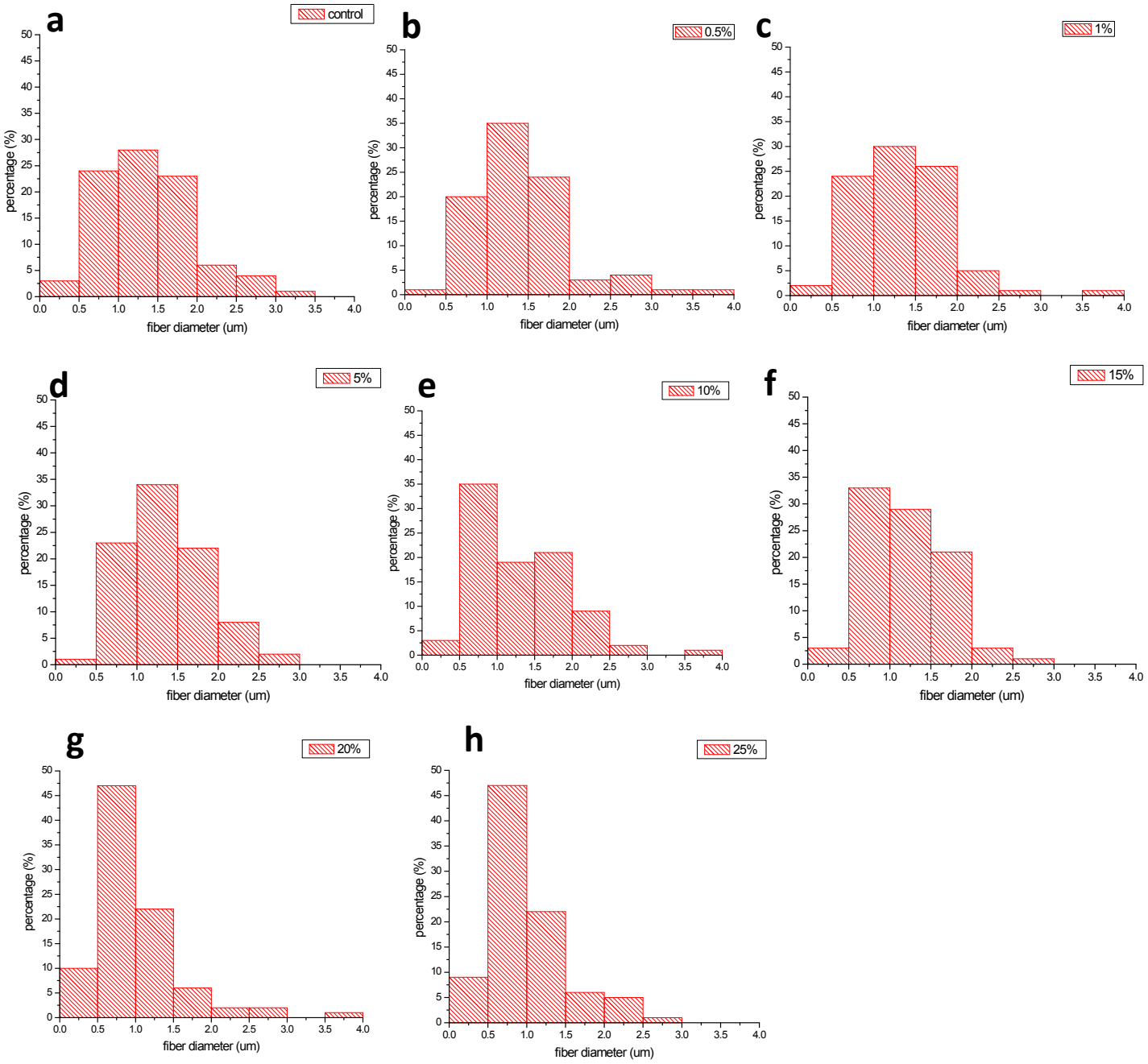


Fig. S3. Diameters distribution of electrospun fibers. (a) PLA fibers as control; and PLA fibers containing (b) 0.5 % wt/wt; (c) 1 % wt/wt; (d) 5 % wt/wt; (e) 10 % wt/wt; (f) 15 % wt/wt (g) 20 % wt/wt; (h) 25 % wt/wt chlorhexidine spheres.

Table S1 Tensile properties of PLA fibers containing different amount of chlorhexidine.

Sample name	Young's modulus (MPa)*	Elongation at break (%)	Strength (MPa)
PLA fibre	31.32±5.85	30.43±2.38	1.55±0.14
PLA fibre-0.5% CHX	25.63±3.06	11.89±1.73	0.70±0.05
PLA fibre-1.0% CHX	10.47±1.14	13.84±0.41	0.37±0.02
PLA fibre-5.0% CHX	11.75±1.81	13.40±0.63	0.36±0.02

* Young's modulus was calculated by the slope of the stress-strain curve at 1% strain

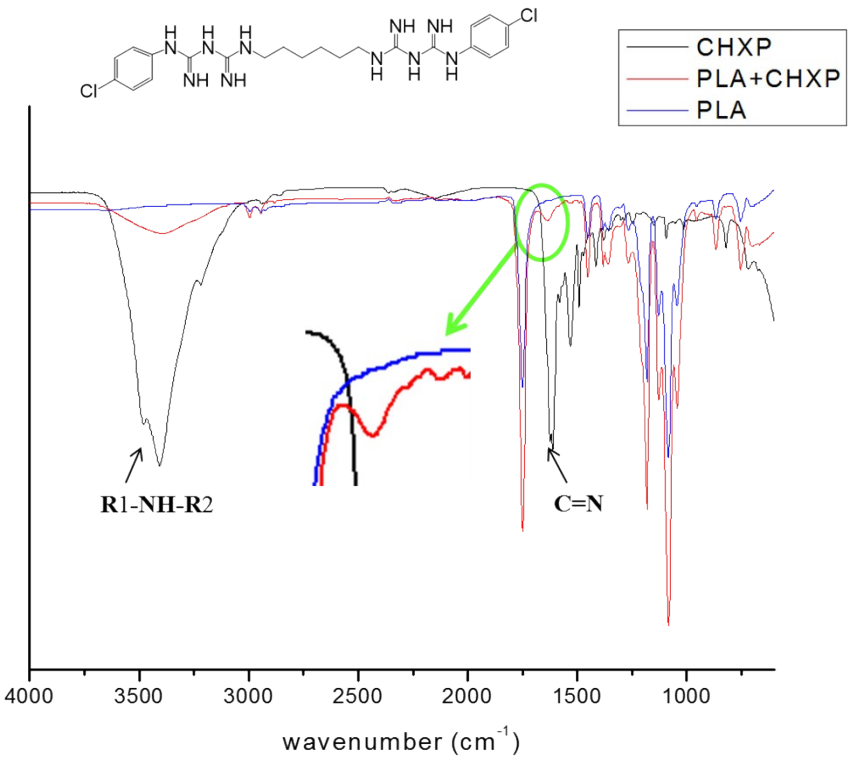


Fig. S4. FTIR spectrum of (blue) PLA fibers as a control; (black) chlorhexidine particles and (red) PLA fibers containing 5 % wt/wt chlorhexidine particles.

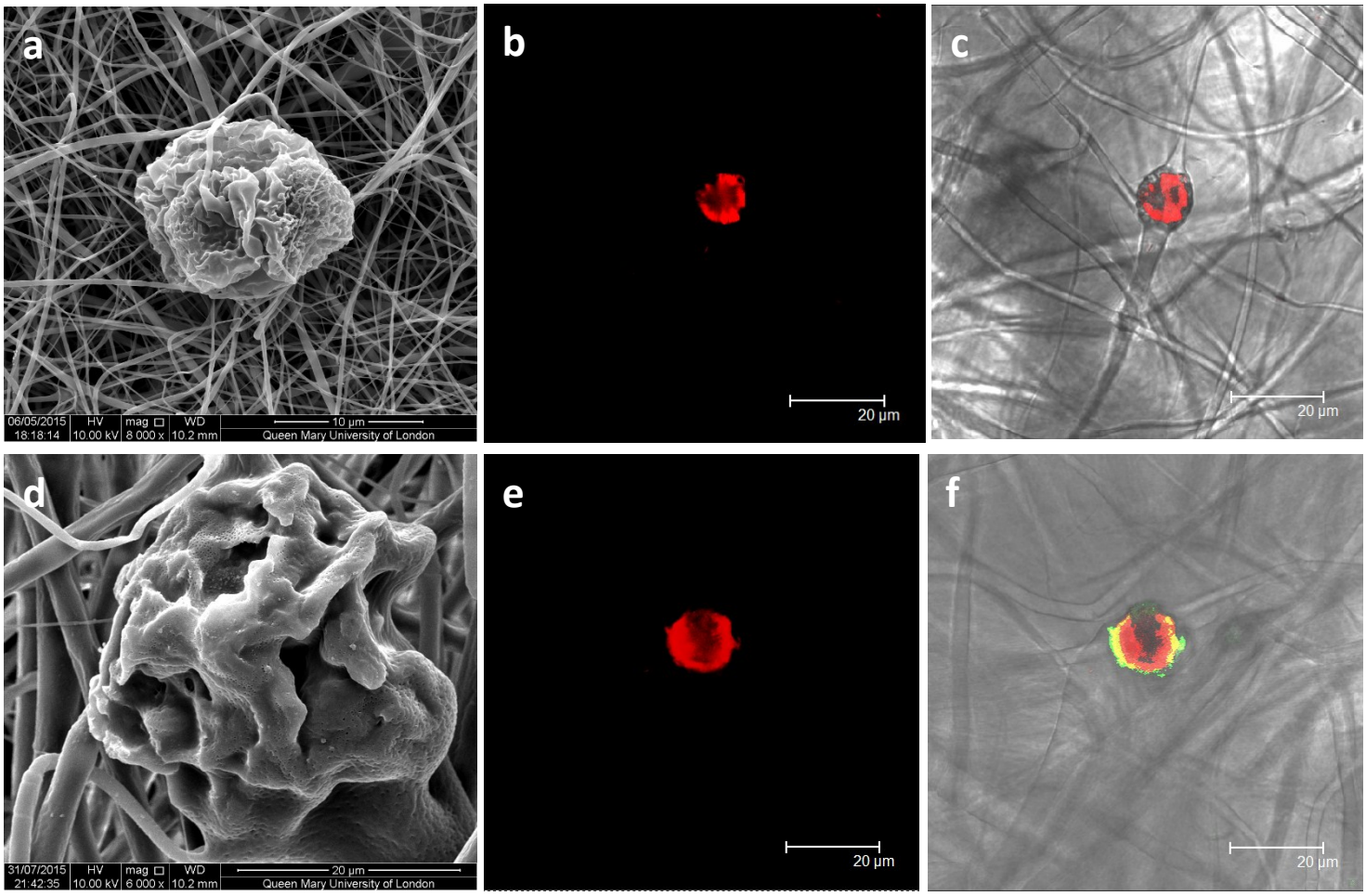


Fig. S5. SEM and confocal images of electrospun fibers after the 650 h release test in PBS. (a, d) SEM images of uncoated chlorhexidine particle and encapsulated chlorhexidine in the fibers; confocal images of uncoated chlorhexidine particle and encapsulated chlorhexidine in the fibers at (b, e) red chaneel and (c, f) over lapped transmitted channel.

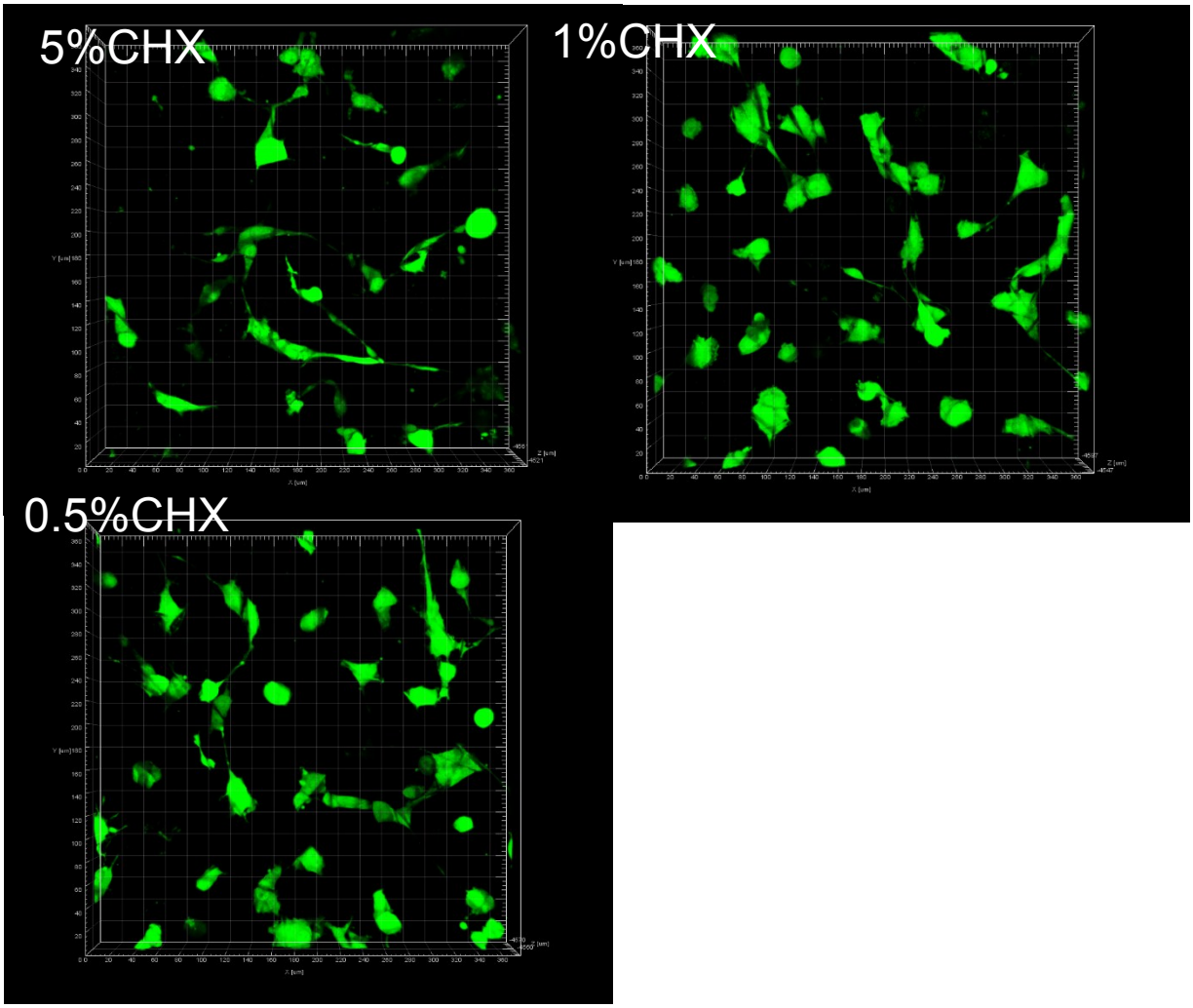


Fig. S6. 3D images of fibroblast adhesion on the fibers containing the encapsulated chlorhexidine, with chlorhexidine loading ratio of 0.1, 0.5, 1 and 5 % wt/wt. 3T3 cells were engineered to express EGFP and cells were cultured on fibers for 24 h.

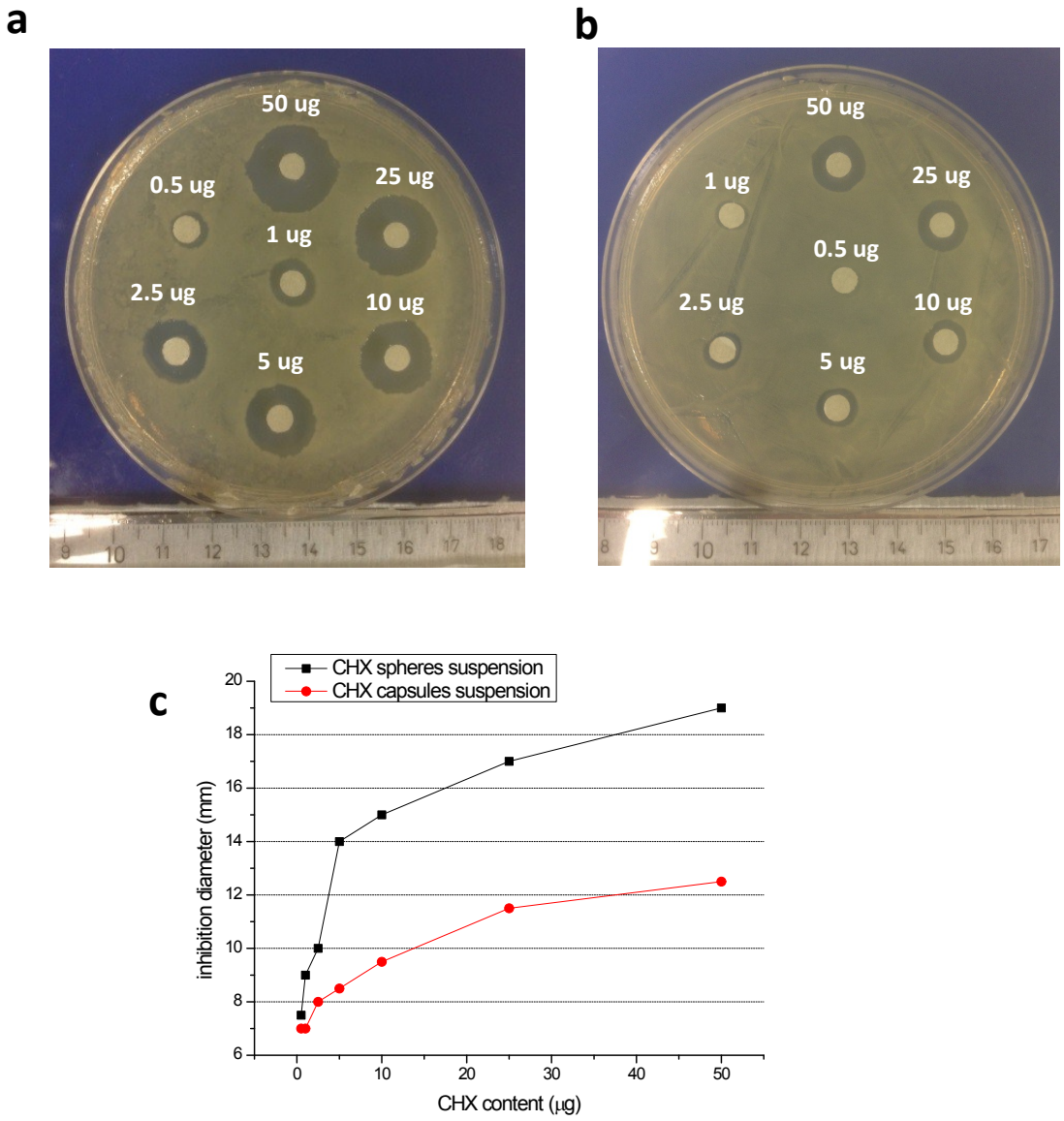


Fig. S7. Inhibition of (a) chlorhexidine particles and (b) encapsulated particles against *E. coli*. (c) comparison of inhibition diameters as a function of chlorhexidine concentration; 10 µl CHX solutions with different amount of CHX content (50, 25, 10, 5, 2.5, 1, 0.5 µg) were added to filters.