

Electronic Supporting Information

Electroactive Biomimetic Collagen-Silver Nanowire Composite Scaffolds

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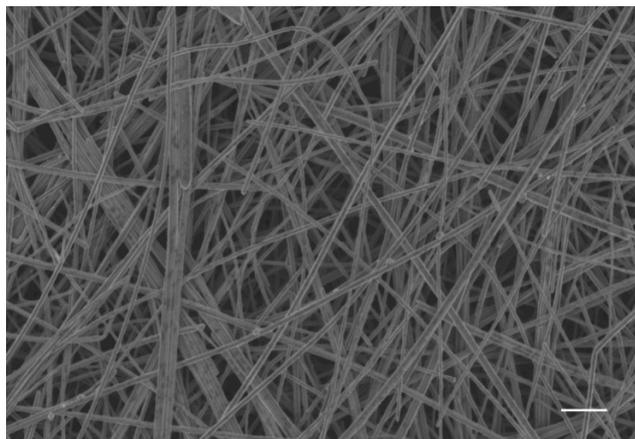


Fig. S1 Scanning electron micrograph of silver nanowires (AgNWs) deposited on a solid support from a suspension with a concentration of 10 mg/ml AgNWs in water. Scale bar: 1 μm .

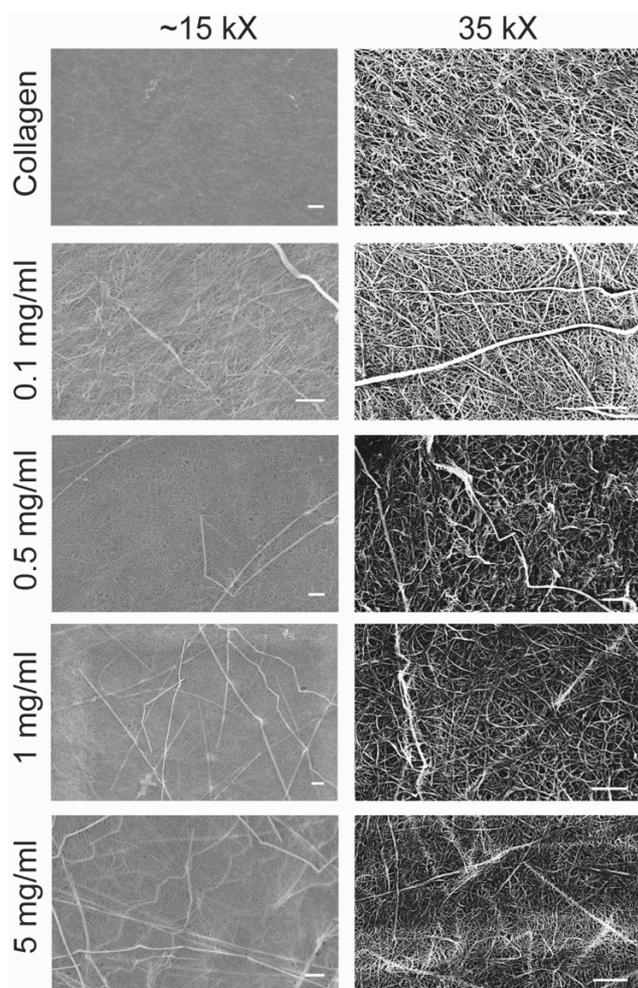


Fig. S2 Scanning electron micrographs of collagen control (0 mg/mL AgNWs) and collagen/AgNW nanocomposites with increasing concentrations of AgNWs. Scale bars: 1 μm .

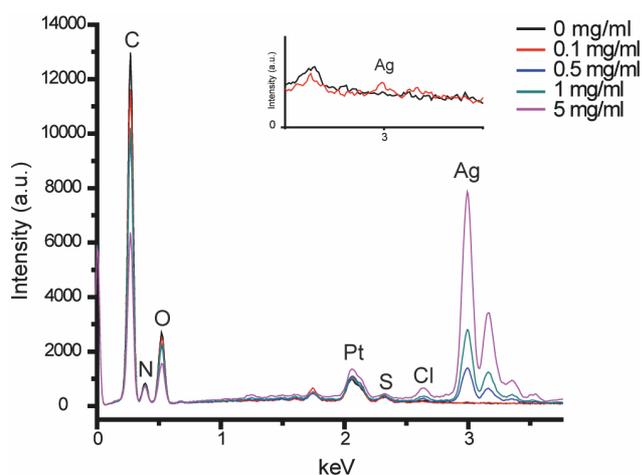


Fig. S3 Elemental spectral analysis of collagen/AgNW nanocomposites, a) EDS of all samples where the higher concentrations between 0.5-5 mg/ml have large increases in the silver content, b) spectra of control and 0.1 mg/ml showing the increase in silver content.

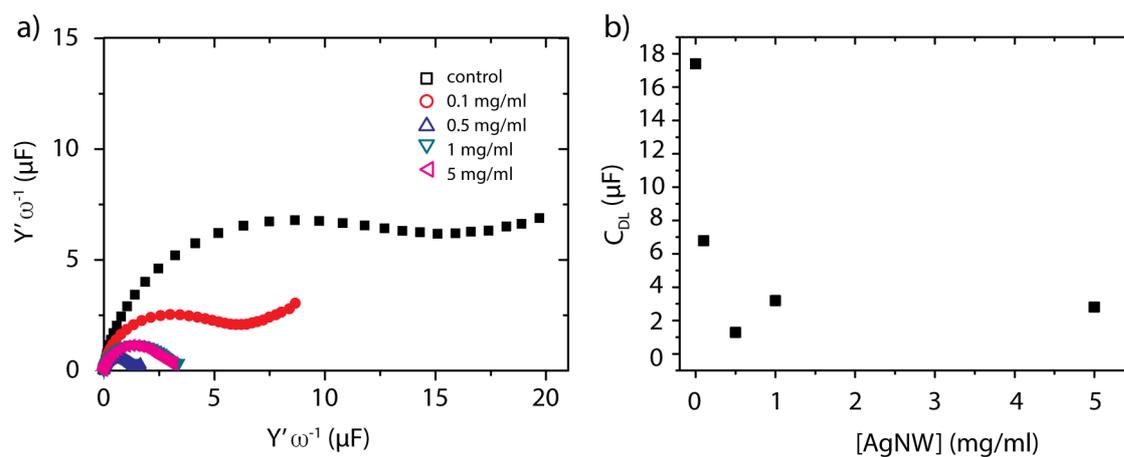


Fig. S4 a) Impedance spectra in complex capacitive coordinates acquired in PBS at 0.6 V on screen-printed graphite disk electrodes modified with the nanocomposites. b) Dependence of double layer capacitance on the nanocomposite AgNW concentration.

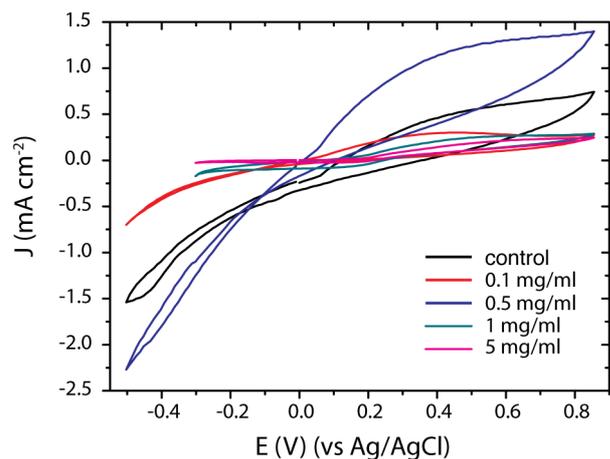


Fig. S5 Cyclic voltammetry of collagen/AgNW nanocomposites recorded with a scan rate 50 mV/s in PBS of the pure collagen meshes, control (0 mg/mL AgNWs) (black curve), and nanocomposites with 0.1 mg/ml (red curve), and 0.5 mg/ml AgNW, (blue curve), 1 mg/ml (green curve), 5 mg/ml (pink curve).

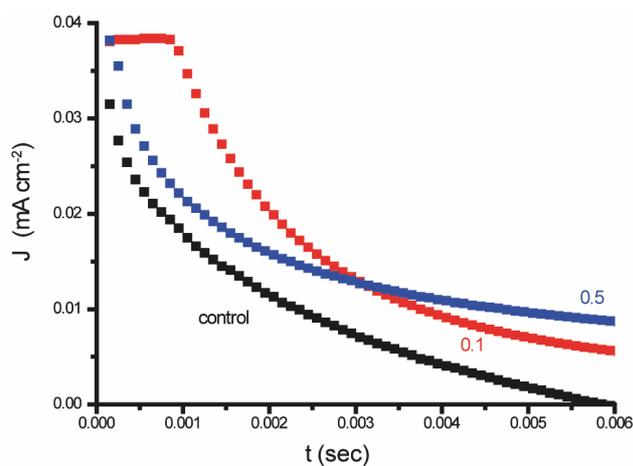


Fig. S6 Linear scale of transient current densities of pure collagen meshes (0 mg/mL AgNWs), and nanocomposites with 0.1 and 0.5 mg/ml AgNWs, obtained using a 0.6 V pulse.

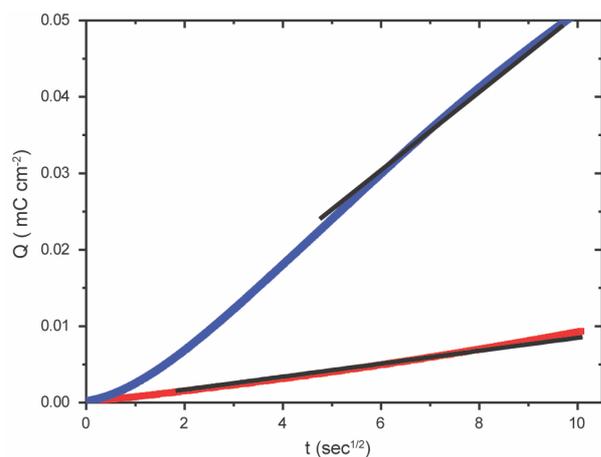


Fig. S7 Anson plot of chronocoulometry data of collagen/AgNW nanocomposites with 0.1 mg/ml (■) and 0.5 mg/ml (■) AgNWs. Solid black lines illustrate the fitted data.

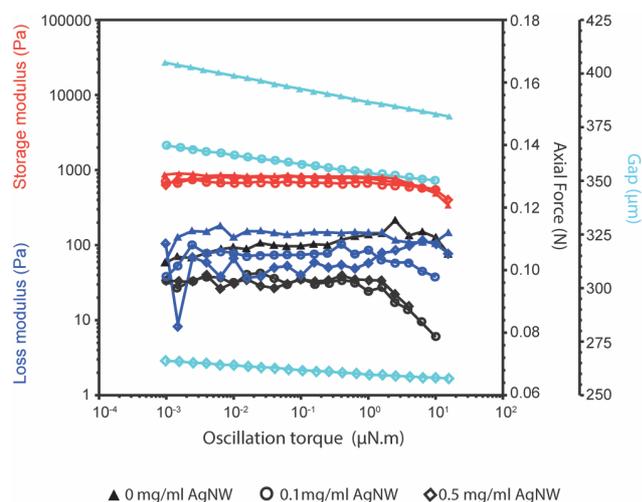


Fig. S8 Amplitude sweep showing experimental constraints used to attain correct data. A small loading was used to keep the material in constant non-compressive contact with the geometry. Since there were no changes in the G' these small forces had no effect on the data collected.

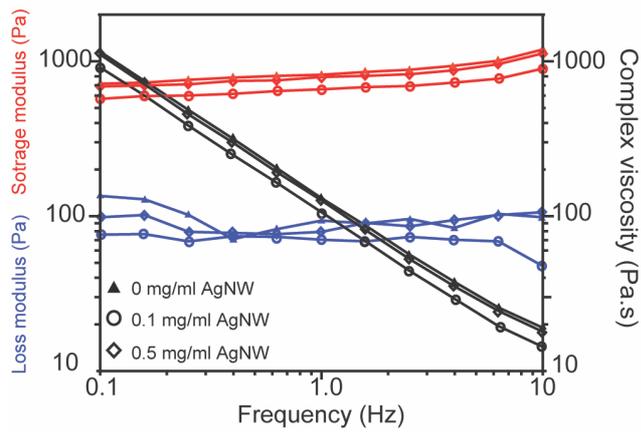


Fig. S9 Frequency sweep on collagen/AgNW nanocomposites. All materials showed frequency independence.

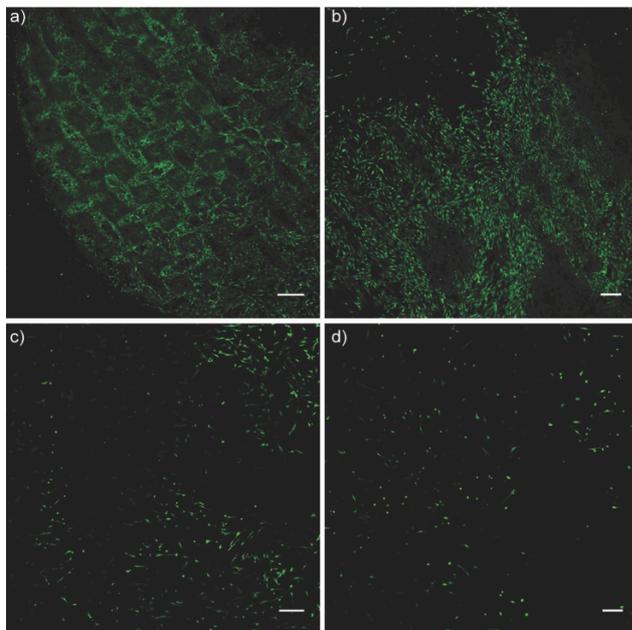


Fig. S10 Live/Dead tiled images of ECCM on collagen/AgNW at day 7 on, a) control (0 mg/ml), b) 0.1 mg/ml, c) 0.5 mg/ml, d) 1 mg/ml. Scale bars: 200 μm

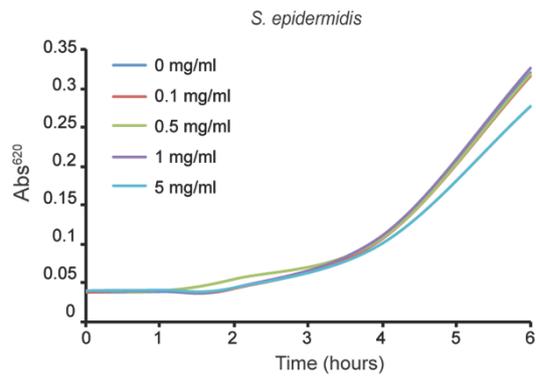
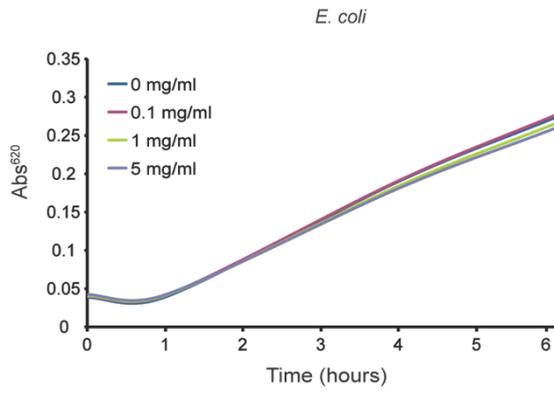


Fig. S11 Collagen and collagen/AgNW nanocomposites cultured in microbial broth of *E.coli* and *S. epidermidis*. There was no significant difference in inhibition of bacterial activity in the broth after 6 hours.