

## SUPPORTING INFORMATION

### **Highly Stable Graphene-Based Nanocomposite (GO–PEI–Ag) with Broad-Spectrum, Long-Term Antimicrobial Activity and Antibiofilm Effects**

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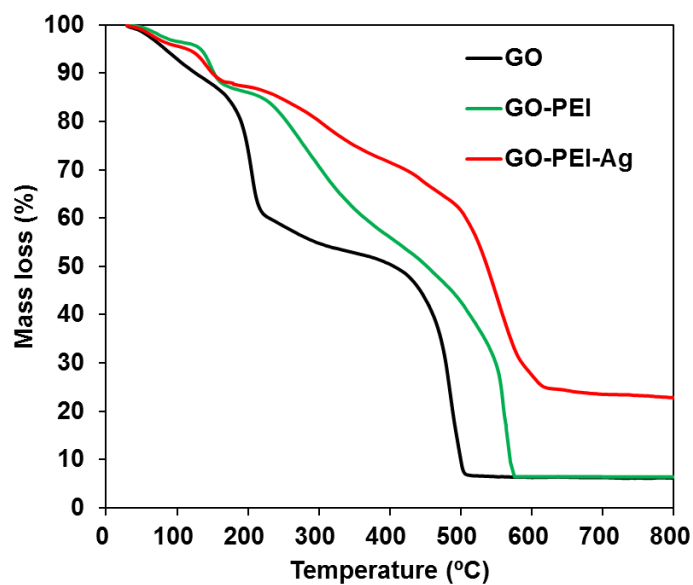
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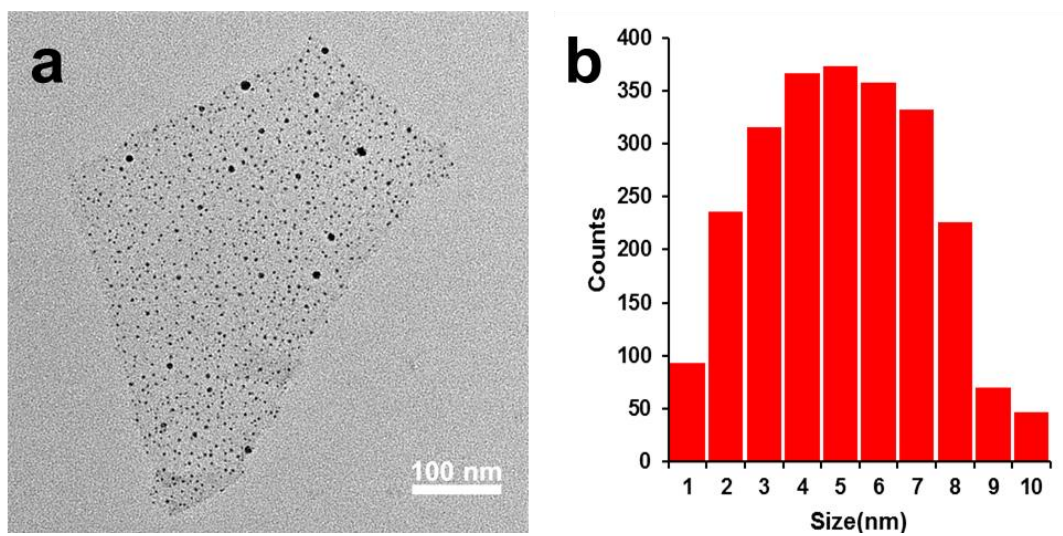
<sup>//</sup>R. Z. and W.K. contributed equally to this work.

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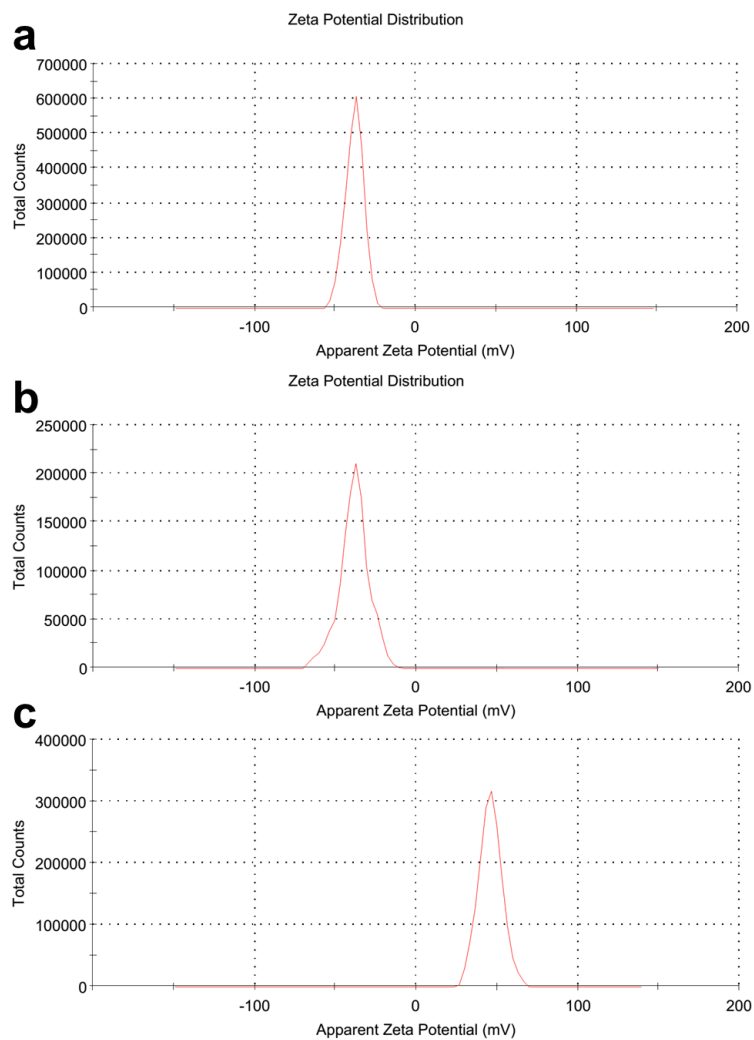
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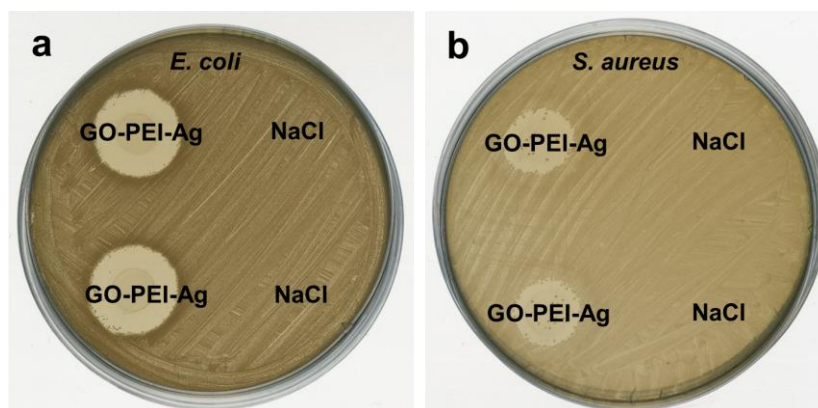
**Figure S1.** Thermalgravimetric curves of GO, GO-PEI, and GO-PEI-Ag.



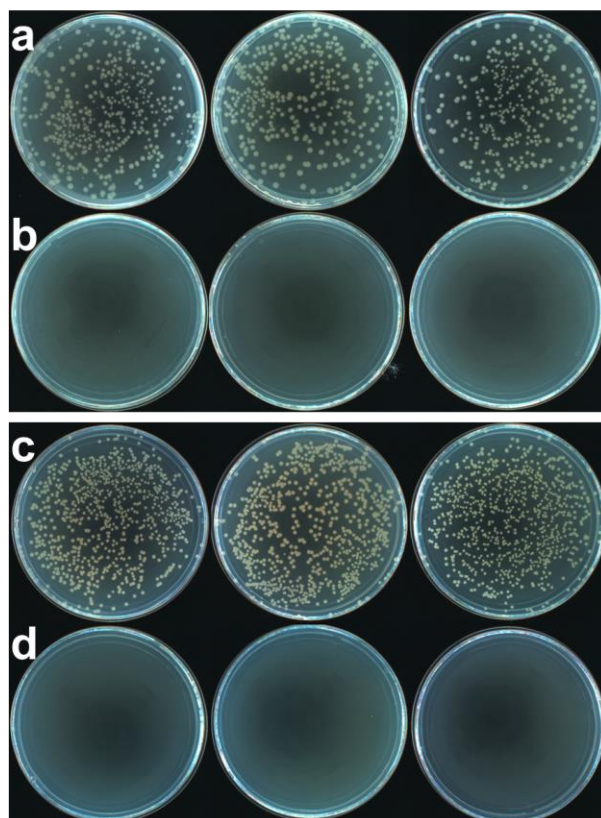
**Figure S2.** (a) Transmission electron microscopic (TEM) image of GO-Ag. (b) Size distribution of AgNPs on GO-Ag.



**Figure S3.** Zeta potential distributions of **(a)** GO, **(b)** GO-Ag, and **(c)** GO-PEI-Ag.



**Figure S4.** Digital Inhibition halos of **(a)** *E. coli* and **(b)** *S. aureus*, resulting from GO-PEI-Ag compared with NaCl.



**Figure S5.** Digital images of bacterial colonies on LB plates after *E. coli* and *S. aureus* inoculated in LB medium containing 0  $\mu\text{g/ml}$  and 10  $\mu\text{g/mL}$  of GO-PEI-Ag for 1 week. **(a)** *E. coli* control group and **(b)** *E. coli* cultured with GO-PEI-Ag; **(c)** *S. aureus* control group and **(d)** *S. aureus* cultured with GO-PEI-Ag.

**Table S1.** The required duration for a certain survival rate of *E. coli* treated with different concentrations of GO-PEI-Ag.

GO-PEI-Ag concentration	Time to a certain survival rate of <i>E. coli</i>		
	50%	10%	1%
2 $\mu\text{g/mL}$	0.5-1 h	3-3.5 h	—
5 $\mu\text{g/mL}$	< 0.5 h	0.5-1 h	1.5-2 h
10 $\mu\text{g/mL}$	< 0.5 h	< 0.5 h	0.5-1 h
20 $\mu\text{g/mL}$	< 0.5 h	< 0.5 h	< 0.5 h

The “—” represents the corresponding concentration of GO-PEI-Ag cannot reduce the survival rate of *E. coli* to the certain value.

**Table S2.** The required duration for a certain survival rate of *S. aureus* treated with different concentrations of GO-PEI-Ag.

GO-PEI-Ag concentration	Time to a certain survival rate of <i>S. aureus</i>		
	50%	10%	1%
2 µg/mL	2-2.5 h	—	—
5 µg/mL	1-1.5 h	2-2.5 h	—
10 µg/mL	< 0.5 h	1-1.5 h	2-2.5 h
20 µg/mL	< 0.5 h	0.5-1 h	0.5-1 h

The “—” represents the corresponding concentration of GO-PEI-Ag cannot reduce the survival rate of *S. aureus* to the certain value.