

**Silent Raman imaging of highly effective anti-bacteria activity
synchronously with biofilm breakage using poly(4-cyanostyrene)
@silver@polylysine nanocomposites**

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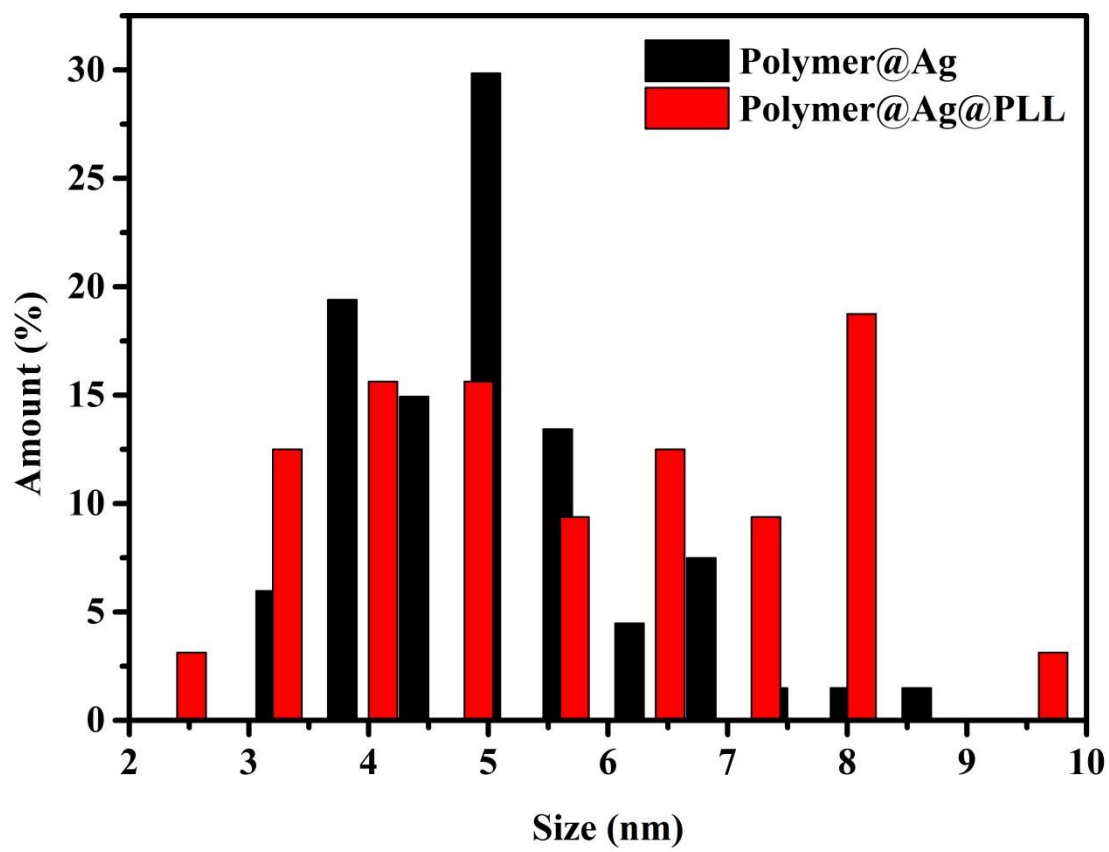


Fig. S1 The average diameter statistics of Ag nanoparticles from Polymer@Ag nanocomposites and Polymer@Ag@PLL nanocomposites using the particle size distribution software.

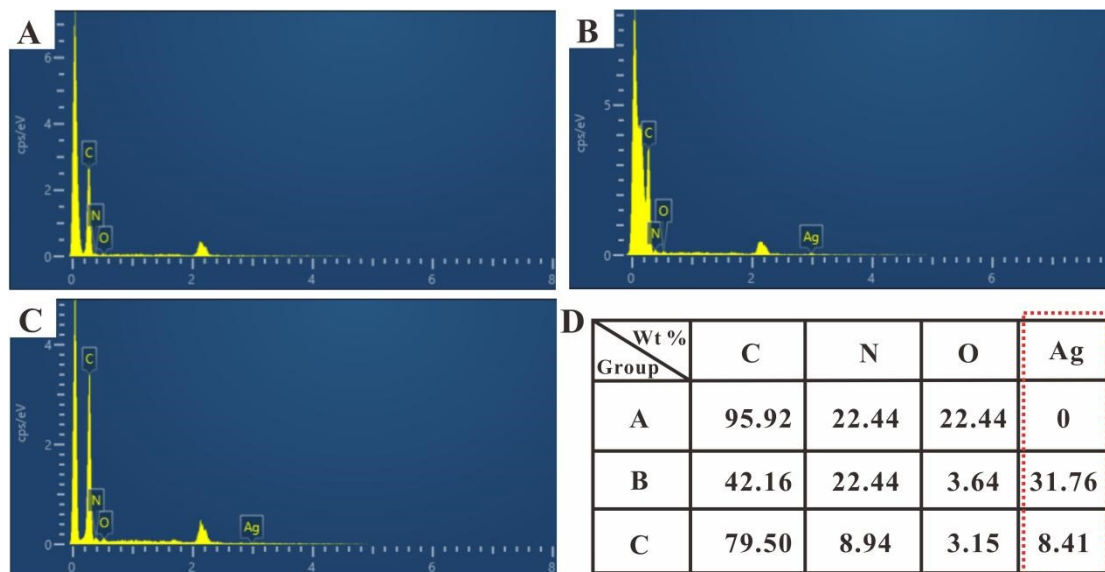


Fig. S2 EDS spectra of poly(4-cyanostyrene) NPs (A), Polymer@Ag nanocomposites (B), and Polymer@Ag@PLL nanocomposites (C). (D) The weight proportion of each element, A-C represents poly(4-cyanostyrene) NPs, Polymer@Ag nanocomposites, and Polymer@Ag@PLL nanocomposites, respectively.

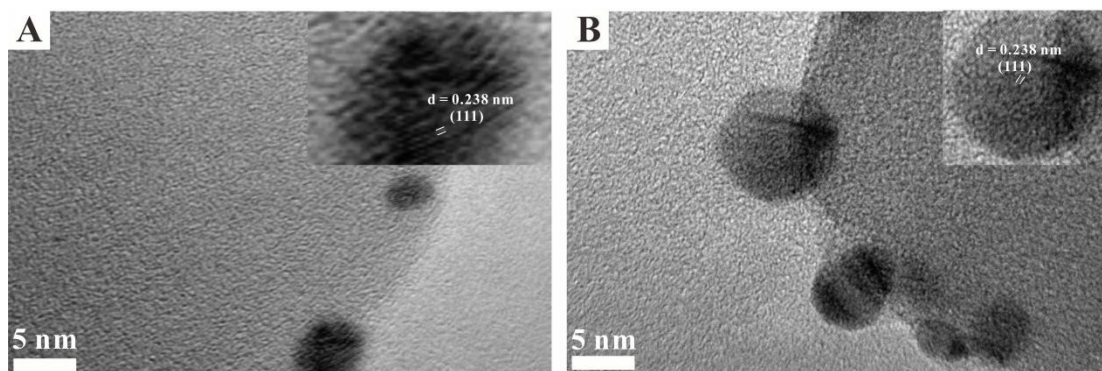


Fig. S3 (A) High-resolution TEM image of Polymer@Ag nanocomposites. (B) High-resolution TEM image of Polymer@Ag@PLL nanocomposites.

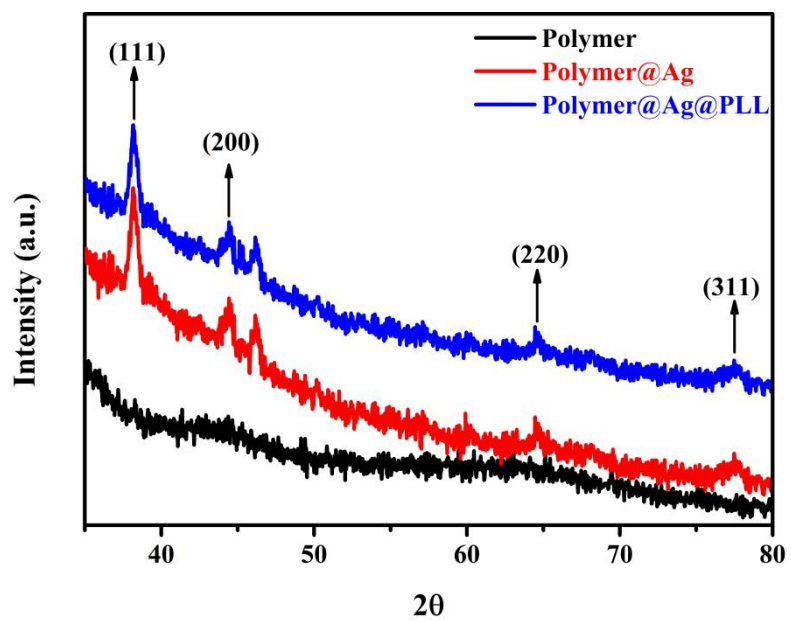


Fig. S4 XRD patterns of Polymer (poly(4-cyanostyrene), Polymer@Ag, and Polymer@Ag@PLL.

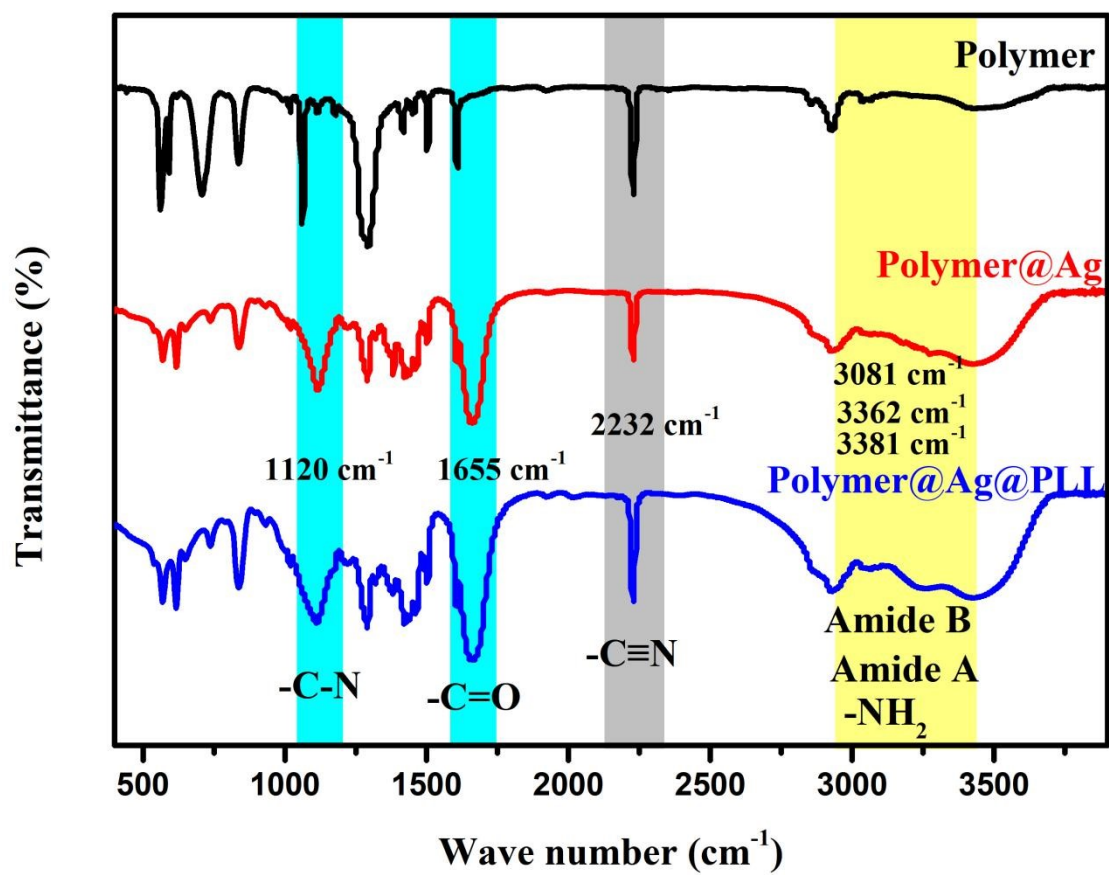


Fig. S5 FT-IR spectra of Polymer (poly(4-cyanostyrene)), Polymer@Ag, and Polymer@Ag@PLL.

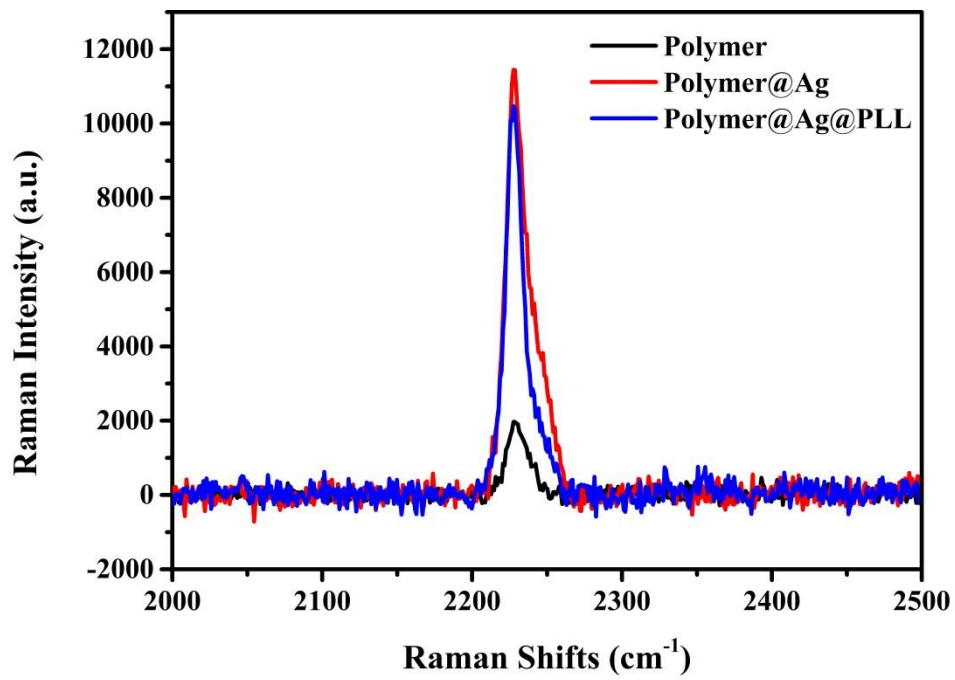


Fig. S6 Raman spectra of Polymer (poly(4-cyanostyrene)), Polymer@Ag, and Polymer@Ag@PLL.

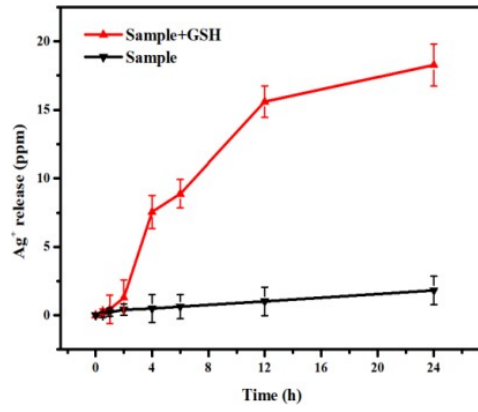


Fig. S7 Ag⁺ releasing from Sample with GSH triggering, Sample: polymer@Ag@PLL nanocomposites.

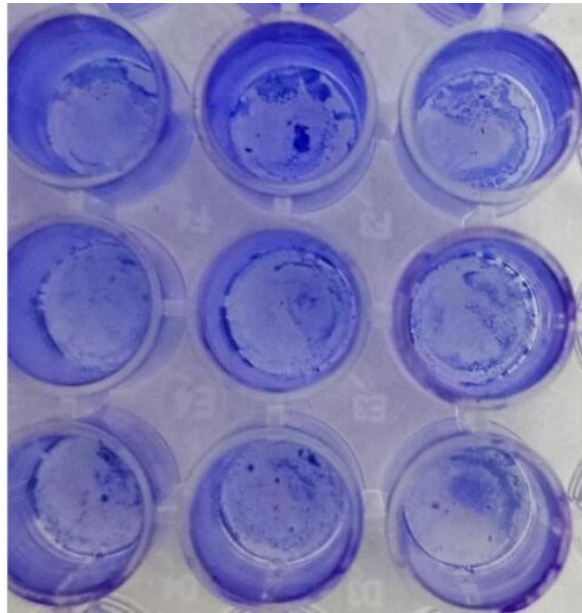


Fig. S8 Digital images of bacterial biofilms formation by CV staining.

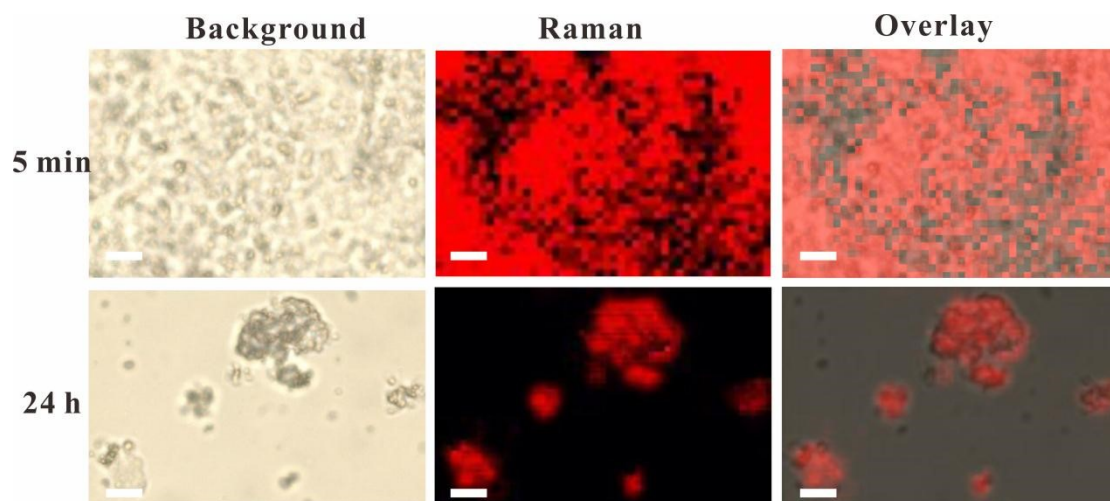


Fig. S9 Raman imaging of *S. aureus*' bacterial biofilm with Polymer@Ag@PLL nanocomposites incubation for 5 min and 24 h (scale bar: 20 μm).