Supporting Information Available

Hemocompatible, Anti-oxidative and Antibacterial Polypropylene by Attaching Silver Nanoparticles Capped with TPGS

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1 Quantitative Data of Fluorescence Intensity on the Surface

The quantitative data of fluorescence intensity from CLSM is shown in Figure S1. The intensity of virgin and Ag NPs treated PP was similar and very high. After grafting, the intensity decreased to 750, a half of PP. While the intensity was only 188 for Ag NPs treated PP-g-P(NIPAAm-*co*-APMA). 90% of Fib was decreased for Ag NPs treated PP-g-P(NIPAAm-*co*-APMA) compare to virgin PP. The results clearly indicated that Ag NPs treated grafting PP prevented the absorption of protein on the surface.

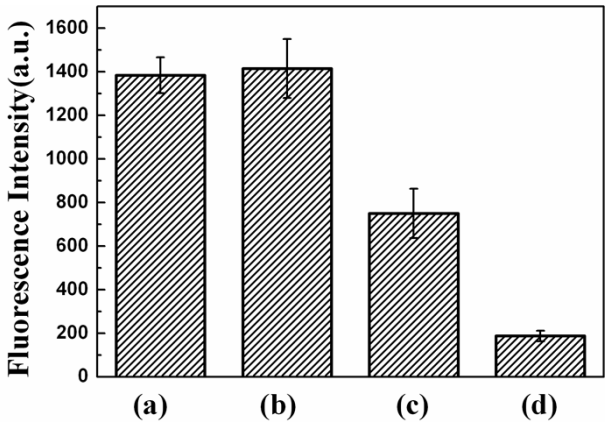

Figure S1. Fluorescenc Intensity of FITC-Fib absorbed on the surface of (a) virgin PP, (b) Ag NPs absorbed surface of virgin PP, (c) PP-g-P(NIPAAm-*co*-APMA) and (d) Ag NPs absorbed surface of PP-g-P(NIPAAm-*co*-APMA)

2 SEM Analysis of Erythrocytes.

The morphology changes in erythrocytes were also investigated by SEM when Ag NPs absorbed PP membranes contacted with blood (Figure S2). The results were corresponding with CLSM. The pointed stars observed from CLSM were clearly shown in SEM. Most of the erythrocytes maintained their normal discoid shapes and

sizes for Ag NPs absorbed PP because of the present of the TPGS, while most of erythrocytes were transformed into echinocytes for unabsorbed samples.

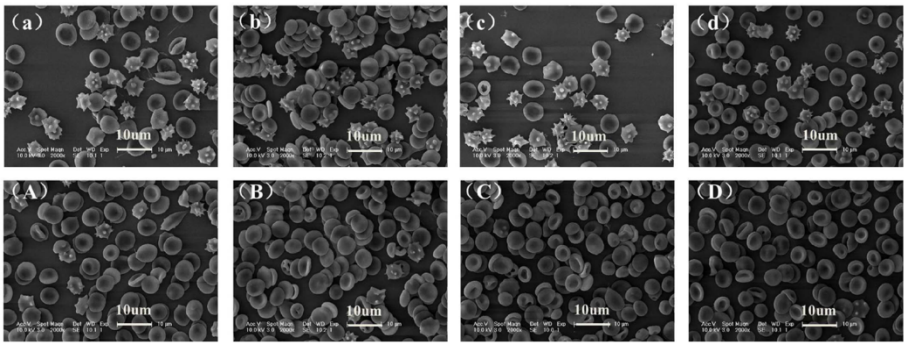

Figure S2. CLSM images of RBCs of (a) PP-g-P(NIPAAm) and (b-d) PP-g-P(NIPAAm-*co*-APMA) with $M_{NIPAAm\ :\ APMA}$ = 2:1, 5:1 and 10:1 and Ag NPs absorbed surface of (A) PP-g-P(NIPAAm), (B-D) PP-g-P(NIPAAm-*co*-APMA) with $M_{NIPAAm\ :\ APMA}$ = 2:1, 5:1 and 10:1.

3 Bacteria Adhesion of S. aureus

The anti-adhesion property of modified PP was also investigated by S.aureus, which is one of typical Gram-positive bacteria. A few of S. aureus were observed on virgin PP and Ag NPs absorbed surface of virgin PP after incubation in PBS (Figure S3a and b). A large number of S. aureus were found on the surface of PP-g-P(NIPAAm-co-APMA) due to electrostatic attraction between positively charged APMA and negatively charged S aureus (Figure S3c). While there were no S. aureus observed on the surface of Ag NPs absorbed PP-g-P(NIPAAm-co-APMA). The results showed that Ag NPs on the surface prevented S aureus adhesion at the early stage and were correspondence with Gram-negative bacteria.

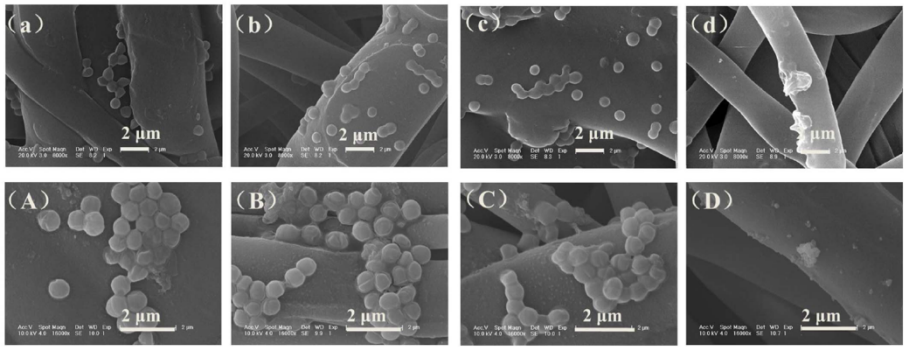

Figure S3. SEM images of S. aureus adhered on the surface (a-d) and incubated on the surface for 24 h (A-D) of (a and A) virgin PP, (b and B) Ag NPs absorbed surface of virgin PP, (c and C) PP-g-P(NIPAAm-co-APMA) and (d and D) Ag NPs absorbed surface of PP-g-P(NIPAAm-co-APMA).

4 Bactericidal Activity of S. aureus

Figure S4 shows bacterial colony forming units (CFU) of S. aureus grown on culture plates for virgin PP and modified PP. The plates of virgin PP (Figure S4a) and Ag NPs treated virgin PP (Figure S4b) and PP-g-P(NIPAAm-*co*-APMA) were covered with a higher number density of bacterial colonies. While Ag NPs absorbed surface of PP-g-P(NIPAAm-co-APMA) can efficiently inhibit the growth of S. aureus. The result shows the effective antibacterial properties of Ag NPs treated surface.

5 Biofilm formation of S. aureus

Figure S3(A-D) showed biofilms formation of S. aureus on virgin and modified PP. S. aureus formed biofilms on virgin PP (Figure S3A) and Ag NPs treated virgin PP (Figure S3B). For PP-g-P(NIPAAm-co-APMA) (Figure S3C), some bacteria exhibited membrane wrinkling due to of the positive charge of APMA. While for Ag NPs absorbed PP-g-P(NIPAAm-co-APMA) (Figure S3D), only few of bacteria

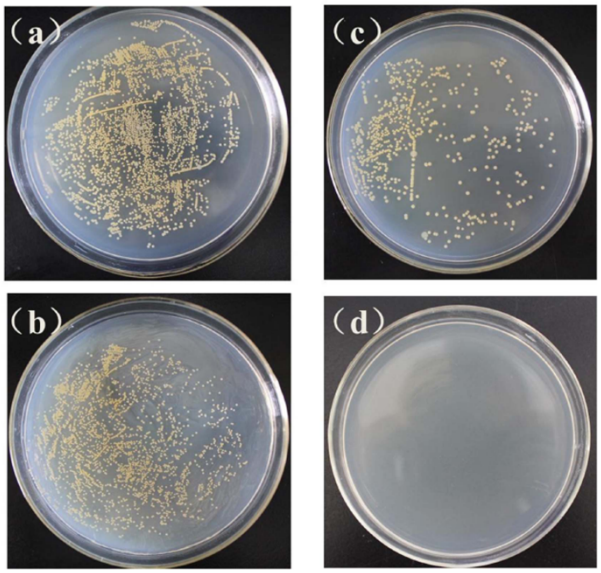

Figure S4. Photographs of agar plates corresponding to the S. aureus suspension recovered from (a) virgin PP, (b) Ag NPs absorbed surface of virgin PP, (c) PP-g-P(NIPAAm-co-APMA) and (d) Ag NPs absorbed surface of PP-g-P(NIPAAm-co-APMA).

absorbed on the surface and most of the bacteria were dead. The above results indicated that Ag NPs on the surface inhibited the formation of biofilm and killed most of the S.aureus on the grafting surface.