

Visible-UVC Upconversion Polymer for Prevention of Microbial Infection

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With the increase of irradiation time, the inhibition of YSO-Pr/PVA/SA on *E. coli* reached the best at 2 h. Shorter periods of light cannot meet the needs of killing bacteria, and longer exposure times do not bring more benefits.

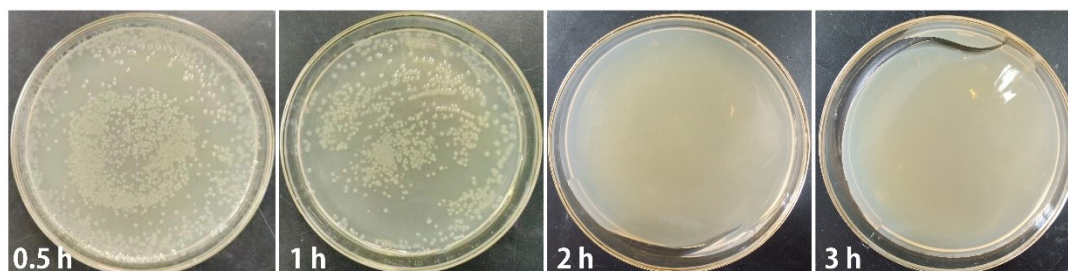


Fig. S1 Influence of irradiation time on the antibacterial effect of YSO-Pr/PVA/SA.

Bacterial inhibition tests were performed for larger bacterial concentrations (*E. coli*). The YSO-Pr/PVA/SA prepared under optimal conditions still showed good inhibition for larger concentrations of bacteria.

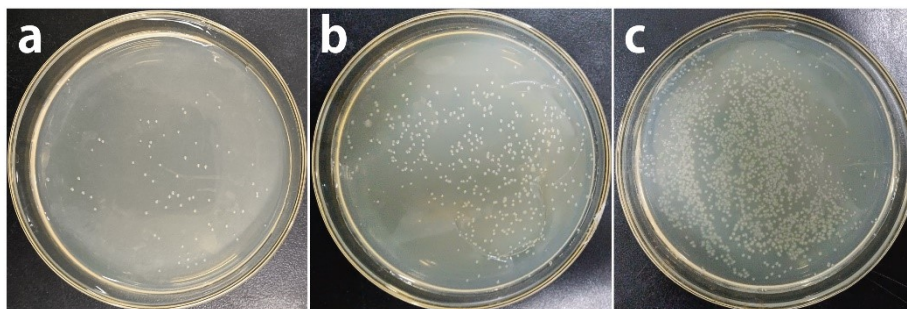


Fig. S2 Inhibition effect of YSO-Pr/PVA/SA on high concentration bacterial suspensions (*E. coli*).
(a) 10^8 cfu/mL; (b) 10^9 cfu/mL; (c) 10^{10} cfu/mL.

In vivo tests demonstrate the inhibitory effect of upconversion antibacterial films against pathogenic bacteria on real wounds.

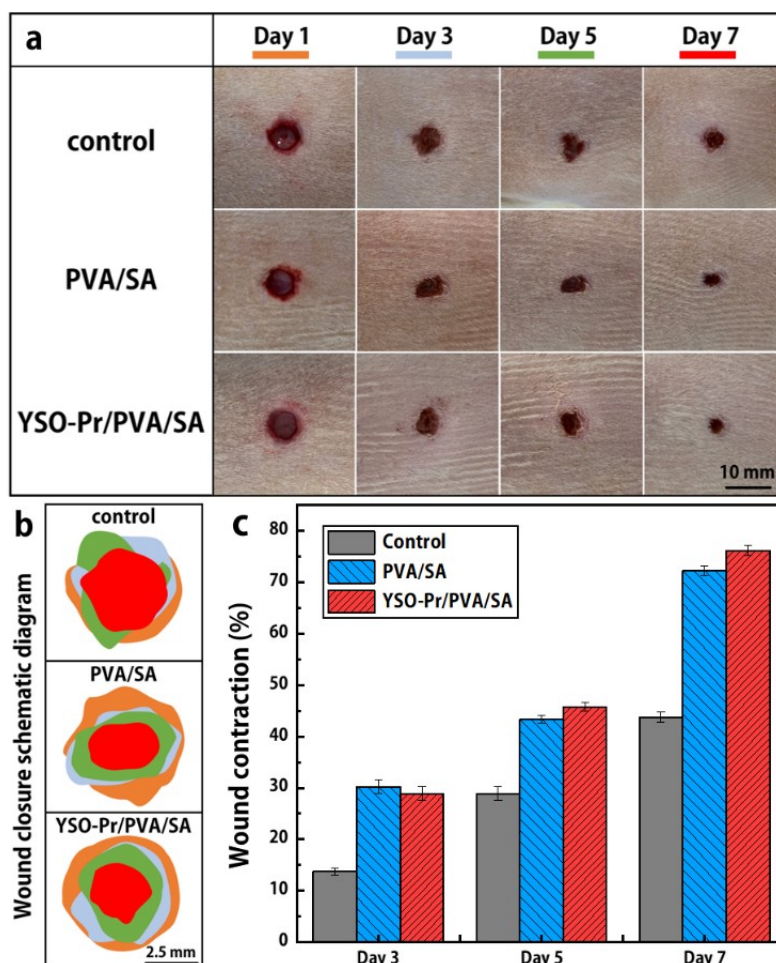


Fig. S3 (a) *In vivo* antibacterial evaluation of PVA/SA and YSO-Pr/PVA/SA simulating *S. aureus* infection; Schematic diagram of the wound closure (b) and wound contraction rate (c) on the 3rd, 5th and 7th day.