

**Ionic liquid enables the preparation of copper-loaded gel with transdermal
delivery function for wound dressings**

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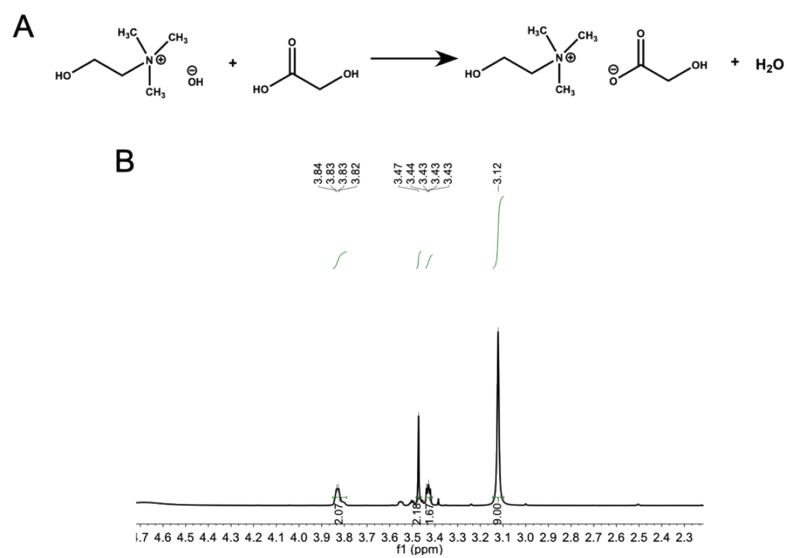


Figure S1. (A) The reaction process for the preparation of the ionic liquid moiety (CGLY). (B) ^1H NMR spectrum of the prepared IL (CGLY).

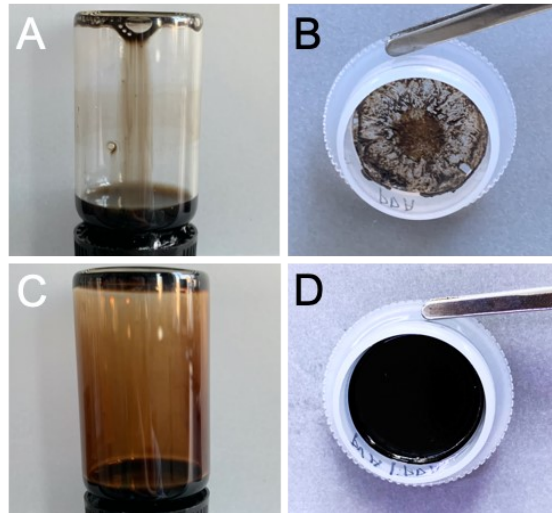


Figure S2. Comparison of the achieved PDA after self-polymerization and in situ polymerization. (A) The photograph of dopamine (DA) solution after the self-polymerization. (B) Self-polymerization of PDA solution drying in a petri dish. (C) The photograph of PVA/PDA solution after in situ polymerization. (D) In situ polymerization of PVA/PDA solution drying in a petri dish.

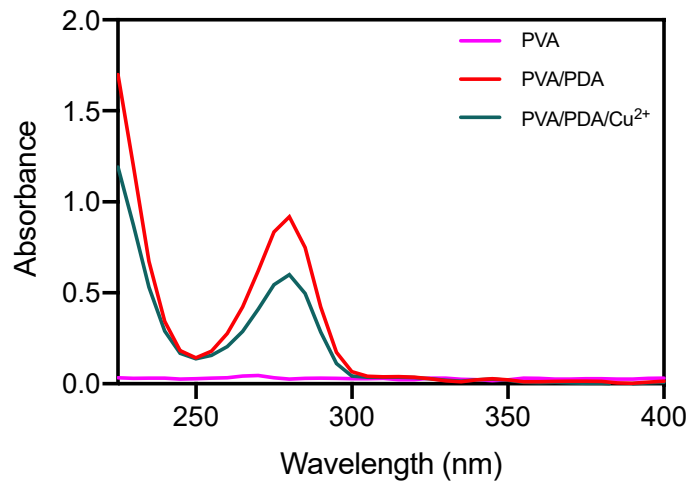


Figure S3. UV-vis absorption spectra of the PVA, PVA/PDA, and PVA/PDA/Cu²⁺ solution. Compared to the PVA/PDA solution, the decrement on the absorption at 270 nm for PVA/PDA/Cu²⁺ illustrated the formation of ionic coordination.

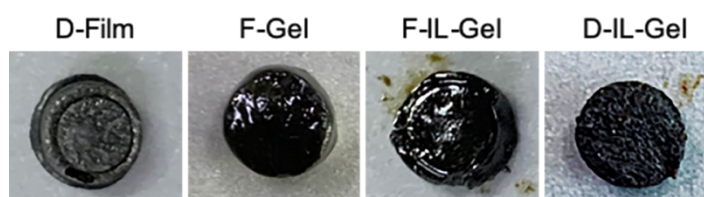


Figure S4. The photographs of the four kinds of gels.

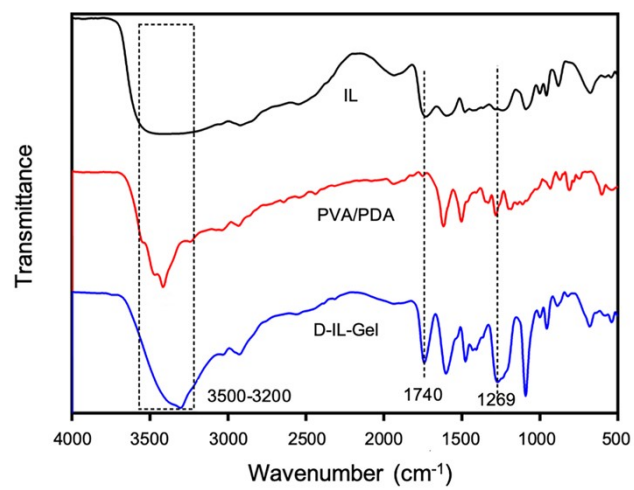


Figure S5. FT-IR spectrum of the IL (CGLY), copolymers and the obtained D-IL-Gel.

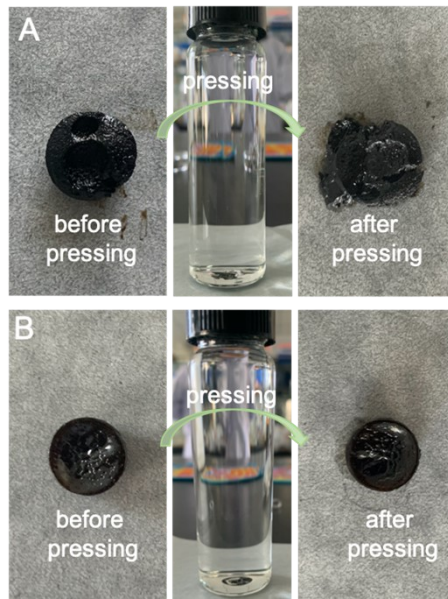


Figure S6. Photographs of (A) F-IL-Gel and (B) D-IL-Gel before and after pressing.

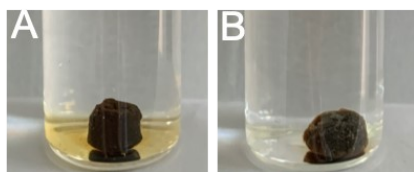


Figure S7. Photographs of (A) F-IL-Gel and (B) D-IL-Gel in water.

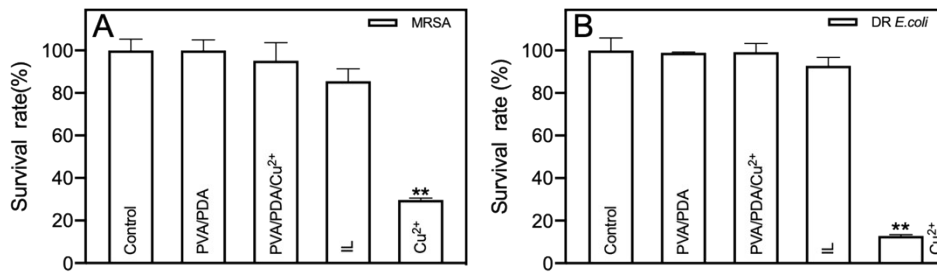


Figure S8. The survival rate of Gram-positive methicillin-resistant *staphylococcus aureus* (MRSA) (A) and drug-resistant Gram-negative *Escherichia coli* (DR-*E. coli*) (B) after treated with control, PVA/PDA, PVA/PDA/Cu²⁺, IL (CGLY) or Cu²⁺. The data are expressed as mean \pm SD of three independent experiments, ** $p < 0.01$.

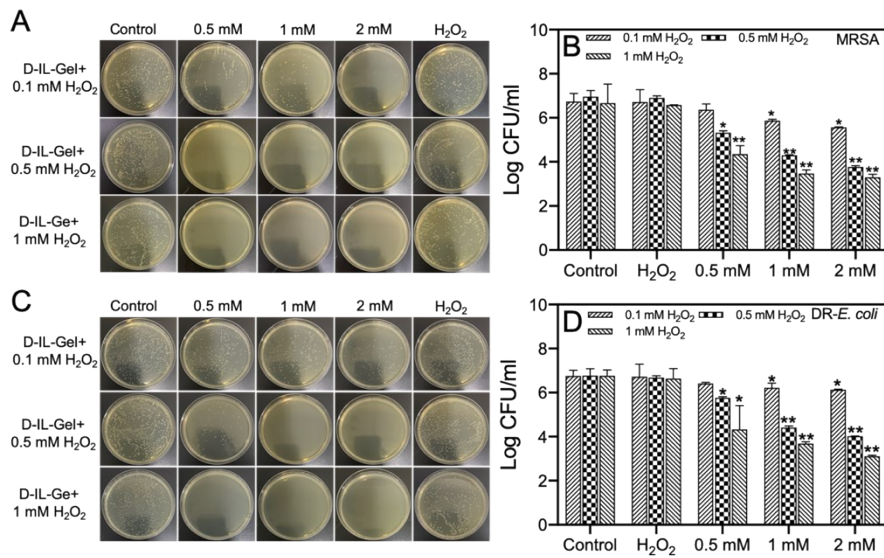


Figure S9. (A) Images of bacterial colonies formed by MRSA treated with (0.5-2 mM) D-IL-Gel and (0.1-1 mM) H₂O₂. (B) CFU analysis of MRSA with above mentioned treatments. (C) Images of bacterial colonies formed by DR-*E. coli* treated with (0.5-2 mM) D-IL-Gel and (0.1-1 mM) H₂O₂. (D) CFU analysis of DR-*E. coli* with above mentioned treatments. The data were expressed as mean \pm SD of three independent experiments, * p <0.05, ** p <0.01.