Electronic Supplementary Information

Melt electrowritten poly(caprolactone) lattice incorporated with silver nanoparticles for directional water transport antibacterial wound dressings

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3.1 Physicochemical properties of the MEW PCL lattices

In practical application, the medical adhesive tape is chosen to fix the hydrophobic layer and hydrophilic layer together, which could be regarded as a wound dressing (Fig. S1).

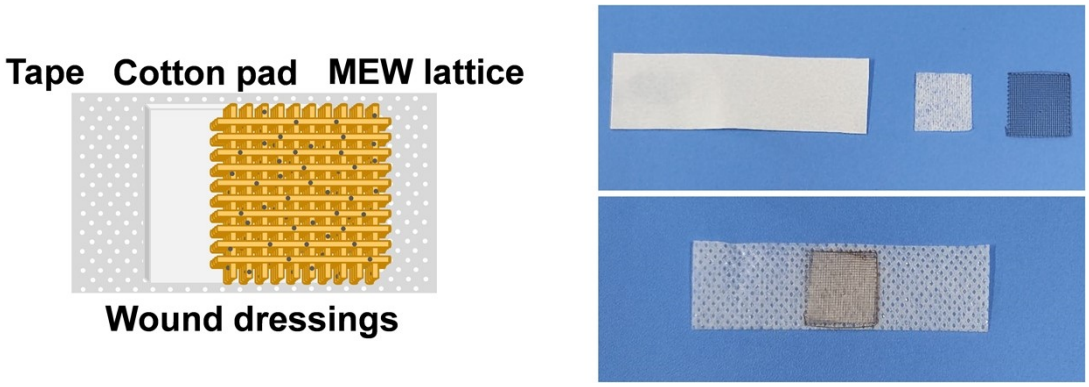

Fig. S1 A schematic illustration of wound dressing.

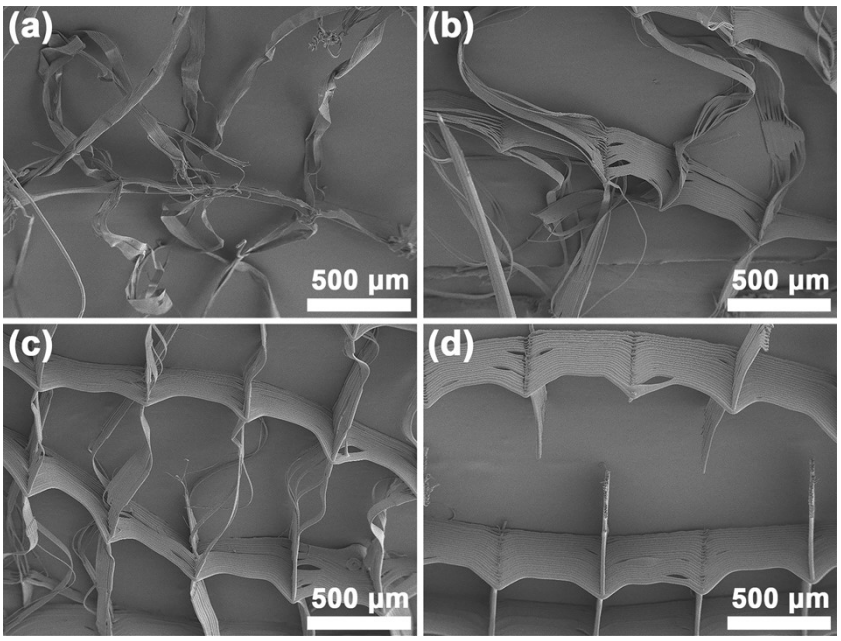

Fig. S2 SEM images of MEW lattices after tensile test with different AgNP concentrations: (a) neat PCL, (b) PCL-Ag1, (c) PCL-Ag2, (d) PCL-Ag3.

3.7 Bactericidal activity of the MEW PCL lattices

As illustrated in Fig. S3, the effect of AgNPs on bacteria morphology was visualized by SEM measurement. The surface morphologies of two kinds of bacteria after treated with PCL lattices containing AgNPs groups were obviously changed when compared with the neat PCL group. The cell wall surface of *E. coli* treated by neat PCL lattice appeared

smooth and complete. However, the bacteria exhibited puckered and withered surfaces after treated by PCL-Ag1, PCL-Ag2, and PCL-Ag3 lattice groups, and this phenomenon became more significant with the increase of AgNP concentration. Likewise, the shape and morphology of *S. aureus* was changed after treatment with PCL-AgNPs lattices. This result is consistent with the previous research about the antibacterial effect of AgNPs-containing materials[1,2], which further supports the antibacterial mechanism of AgNPs causing bacterial death by damaging cell structures of the bacteria[3].

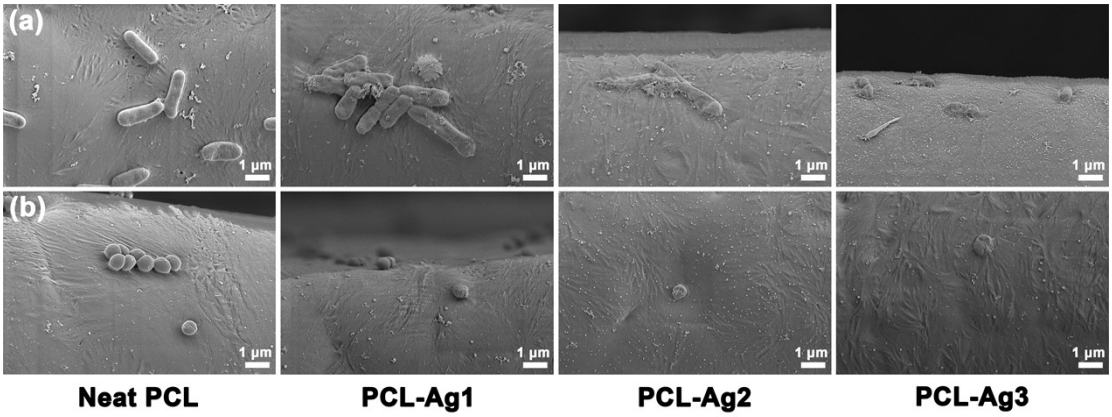

Fig. S3 SEM images of (a) *E. coli* and (b) *S. aureus* treated with neat PCL lattice, PCL-Ag1 lattice, PCL-Ag2 lattice, and PCL-Ag3 lattice.

Supporting Videos

Video S1 Tensile process of PCL lattices with different AgNP concentrations (neat PCL, PCL-Ag1, PCL-Ag2 and PCL-Ag3).

Video S2 The unidirectional fluid draining capability of PCL-Ag2/cotton composite dressing.

References

1 Q. Guo, Y. Zhao, X. Dai, T. Zhang, Y. Yu, X. Zhang and C. Li, *ACS Appl. Mater. Interfaces*, 2017, **9**, 16834-16847.

2 O. Bozkaya, E. Arat, Z. G. Gök, M. Yiğitoğlu and İ. Vargel, *Eur. Polym. J.*, 2022, **166**, 111023.

3 Q. Jiang, Z. Lin, B. Gu, C. Pang and X. Wang, *Ind. Crops Prod.*, 2020, **158**, 112987.