

Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B  
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## Hydrophilic and anti-adhesive modification of porous polymer microneedles for rapid dermal interstitial fluid extraction

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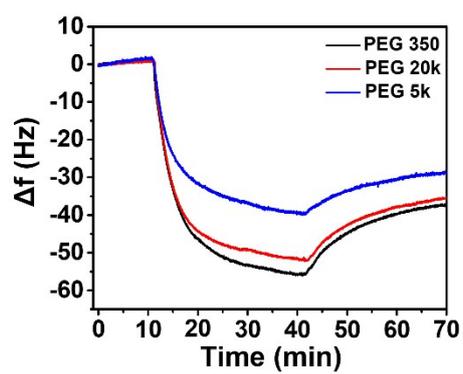
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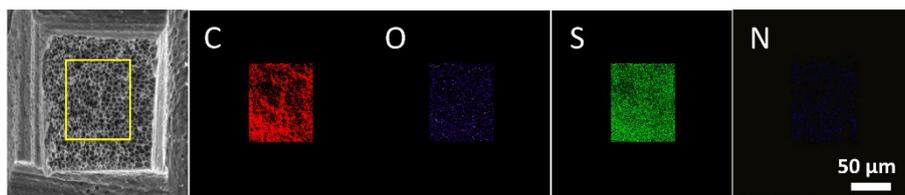
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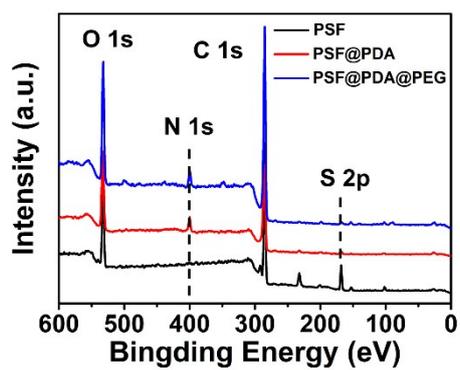
## Supplementary Figures:



**Fig. S1** Change of frequency shift ( $\Delta f$ ) for the adsorption of BSA on PEG-coated PSF@PDA surface with different molecular weights at 25 °C over time



**Fig. S2** Elemental mappings by EDX analysis of PSF@PDA MNs. The scale bar in last image can be used in others.



**Fig. S3** Survey XPS spectra of PSF, PSF@PDA, and PSF@PDA@PEG MNs.

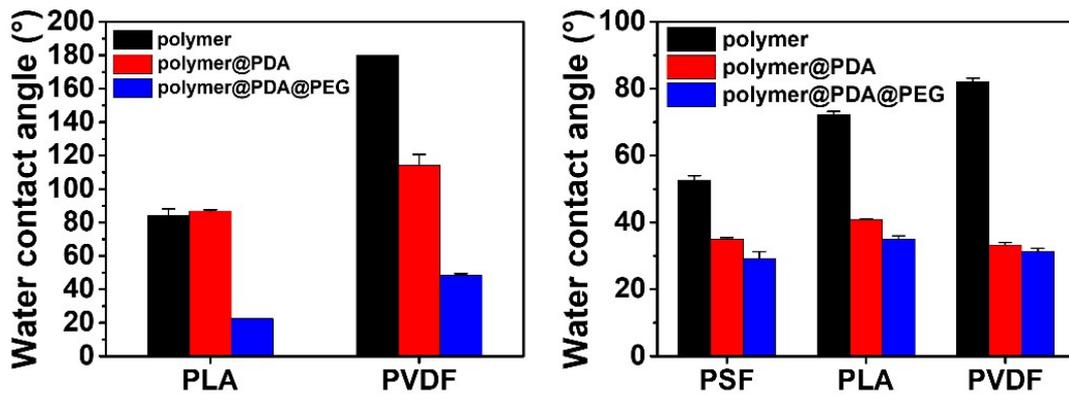
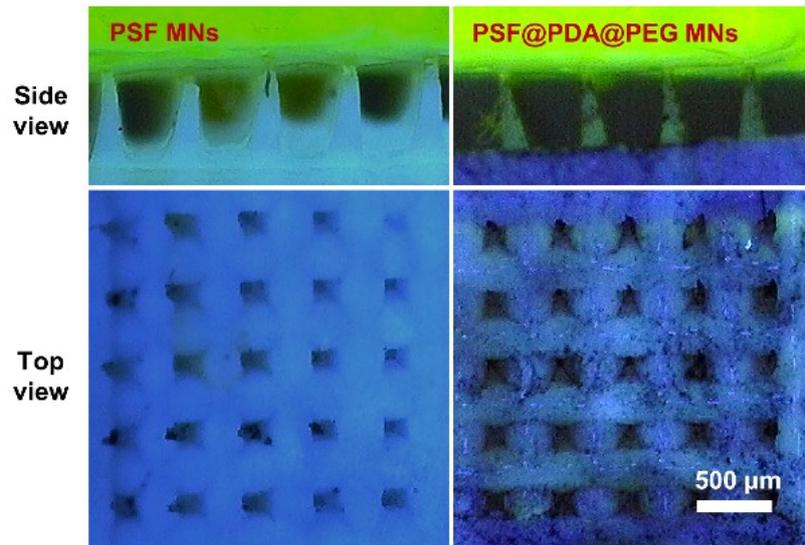
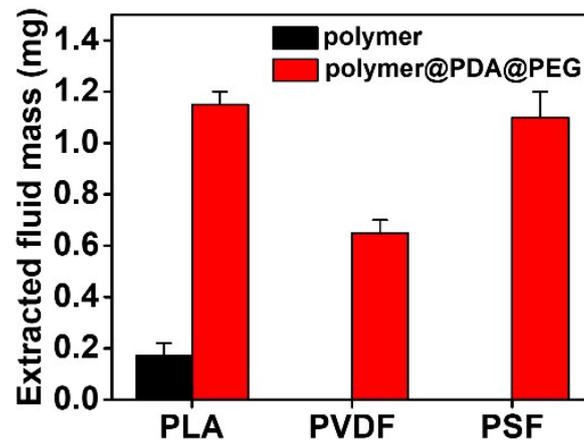


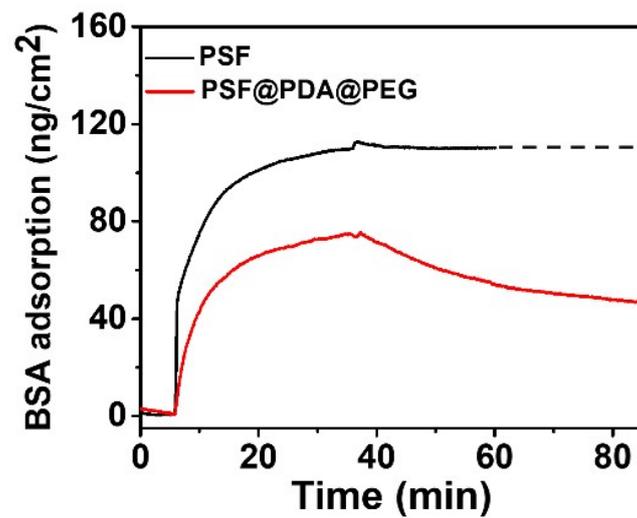
Fig. S4 WCA of MNs (a) and film (b) made of different polymers with different coatings.



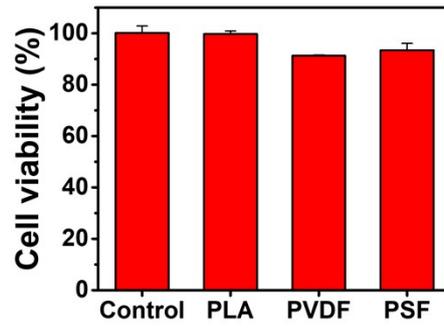
**Fig. S5** Extraction of sodium fluorescein labeled hyaluronic acid (HA-FS) from agarose hydrogel with PSF MNs before and after modification after 30 min-insertion. The green fluorescence signal reached to the base of PSF@PDA@PEG MNs, indicating a successful extraction of HA-FS from the hydrogel. The scale bar in the last image at the lower right applies to others.



**Fig. S6** Water extraction mass of different MNs from agarose hydrogel in 10 min before and after modification with PDA and PEG.



**Fig. S7** Adsorbed mass of BSA on PSF and PSF@PDA@PEG surfaces at 25 °C as a function of time calculated by Sauerbrey Equation.



**Fig. S8** Cell viability of NIH-3T3 incubated with porous polymer MNs coated with PDA and PEG for 36 h.