

Supporting Information

3D printing silk fibroin/polyacrylamide triple-network composite hydrogel with stretchability, conductivity, and strain-sensing ability as bionic electronic skin

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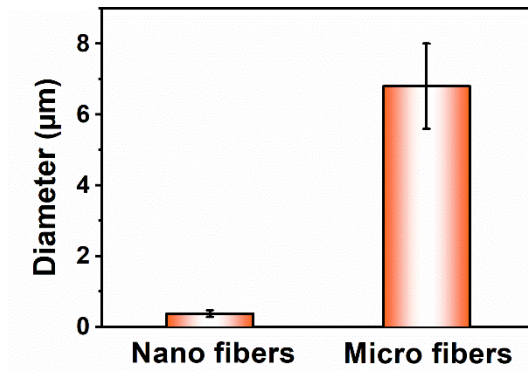


Figure S1. The relative scale of SMF.

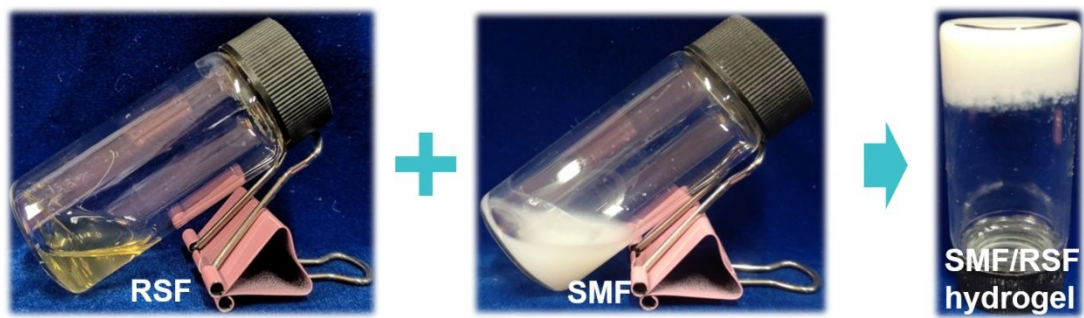


Figure S2. Physical gelation process of RSF/SMF hydrogel.



Figure S3. Gelation process of PAM/RSF hydrogel under white light.

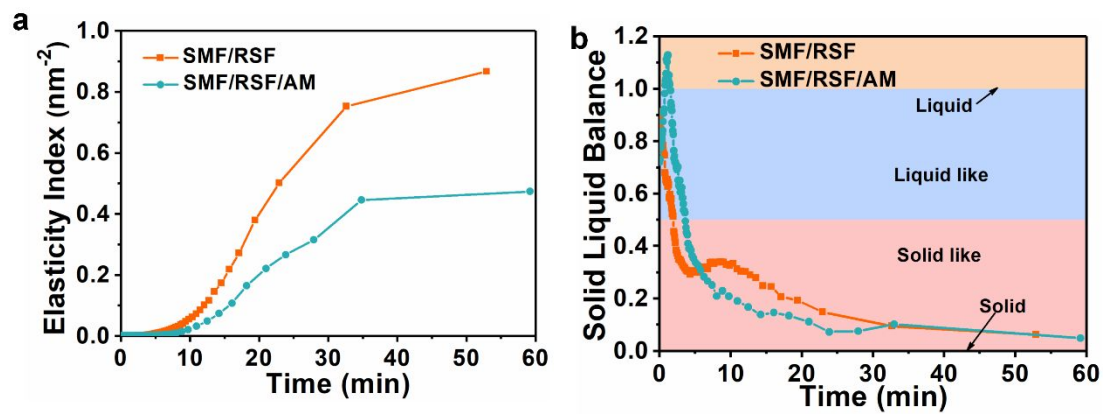


Figure S4. (a) Gelation time of RSF/SMF and AM/RSF/SMF hydrogels. (b) The phase transition of RSF/SMF and AM/RSF/SMF hydrogels.

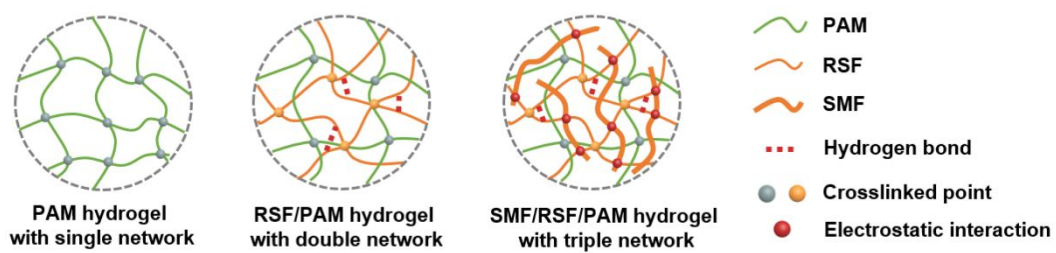


Figure S5. Schematic images of PAM, RSF/PAM, and SMF/RSF/PAM hydrogels

with different network.

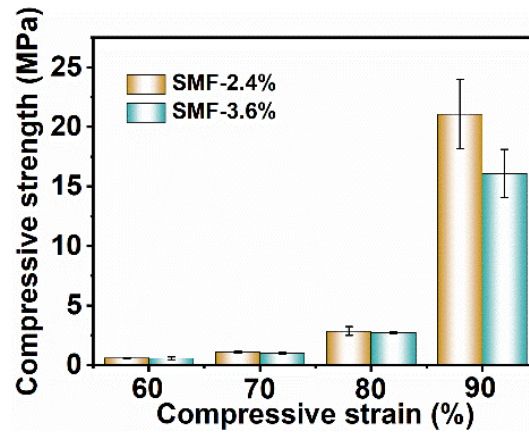


Figure S6. Compressive strength of SMF-2.4% and SMF-3.6% at different compressive strain.

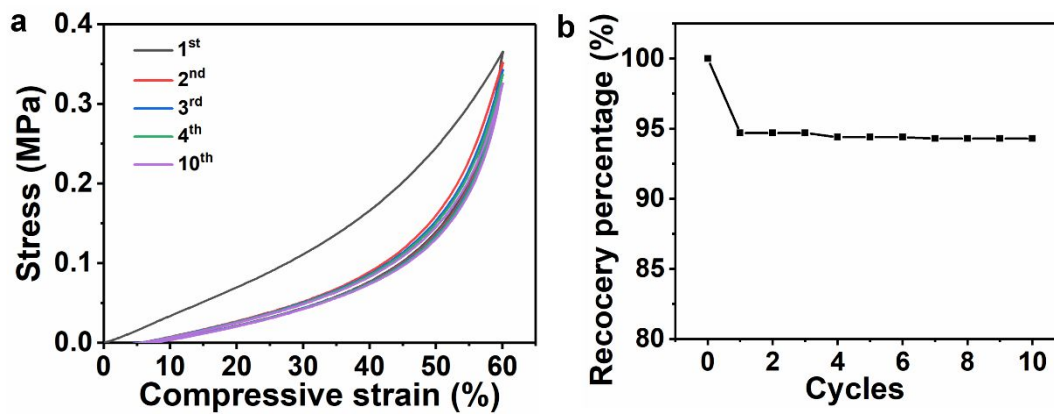


Figure S7. (a) Recycle load-unload compressive stress-strain curves of SMF/RSF/PAM hydrogel. (b) The recovery percentage of the SMF/RSF/PAM hydrogel in 10 continuous compression-relaxation cycles.

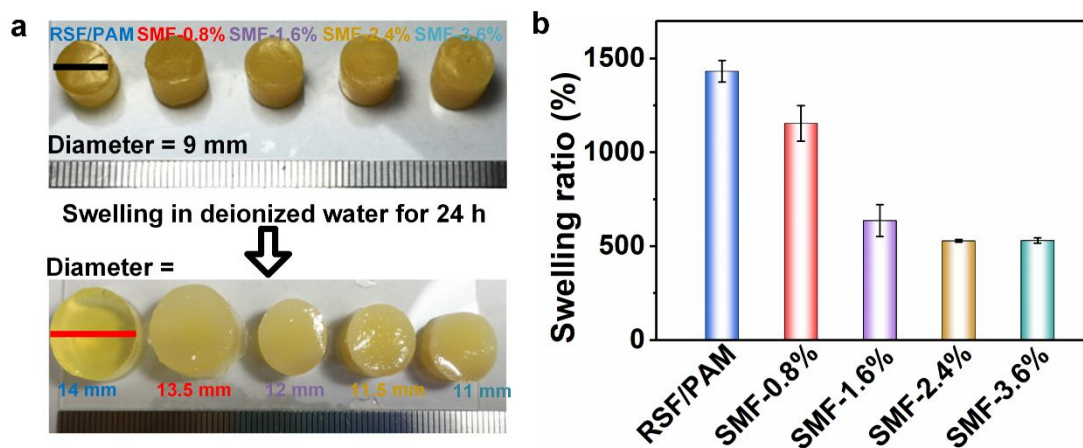


Figure S8. Swelling of RSF/PAM and SMF/RSF/PAM hydrogels in deionized water for 24 h. (a) Photograph of hydrogel samples. (b) Swelling ratios of hydrogels.

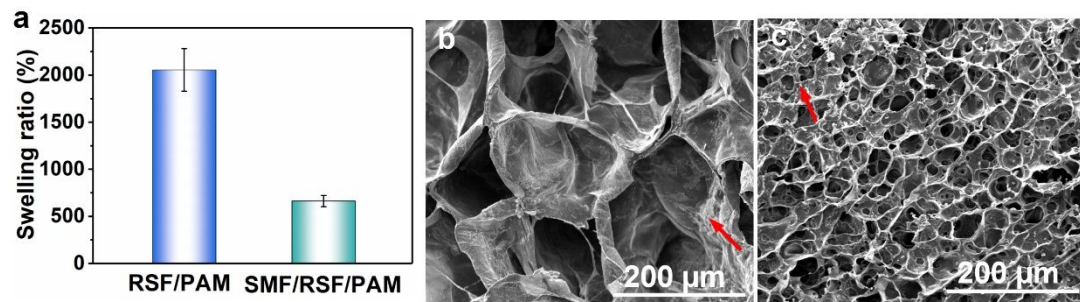


Figure S9. (a) Swelling ratios of RSF/PAM and SMF/RSF/PAM hydrogels in PBS for 24 h. SEM images of (b) RSF/PAM and (c) SMF/RSF/PAM hydrogels after swelling in PBS. The SMF/RSF/PAM hydrogel with a 3.6% SMF content was considered.

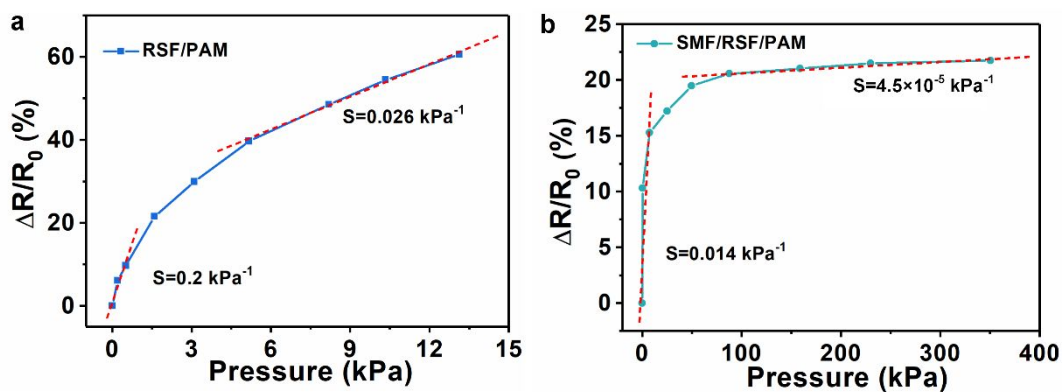


Figure S10. Relative resistance changes of the (a) RSF/PAM and (b) SMF/RSF/PAM hydrogel sensors on applied tension. The y-axis of (a) and (b) are the absolute values of the results. “S” represents the “pressure sensor sensitivity”.

Table S1. Secondary structures of RSF powder and RSF gel

Sample	β -sheet (%)	amorphous/helix (%)	β -turn (%)
RSF powder	7.8	70.1	22.1
RSF gel	11.1	72.0	16.9