

Supporting information:

Highly Stretchable Porous Regenerated Silk Fibroin Film for Enhanced Wound Healing

*Fengchao Sun^{a, b}, Dongdong Xiao^{c, d}, Hui Su^{a, b}, Zhiliang Chen^{a, b}, Bijia Wang^{a, b},
Xueling Feng^{a, b}, Zhiping Mao^{a, b}, Xiaofeng Sui^{a, b*}*

*^a Key Lab of Science & Technology of Eco-Textile, Ministry of Education, College of
Chemistry, Chemical Engineering and Biotechnology, Donghua University, Shanghai,
201620, China*

*^b Shanghai Belt and Road Joint Laboratory of Textile Intelligent Manufacturing,
Shanghai, 201620, China*

*^c Department of Urology, Ren Ji Hospital, School of Medicine, Shanghai Jiao Tong
University, Shanghai, 200001, China*

*^d Shanghai Key Laboratory of Tissue Engineering, Shanghai Ninth People's Hospital,
School of Medicine, Shanghai Jiao Tong University, Shanghai, 200011, China*

**Corresponding authors:*

E-mail: suixf@dhu.edu.cn (Xiaofeng Sui)

Address: No. 2999 North Renmin Road, Shanghai 201620, People's Republic of China.

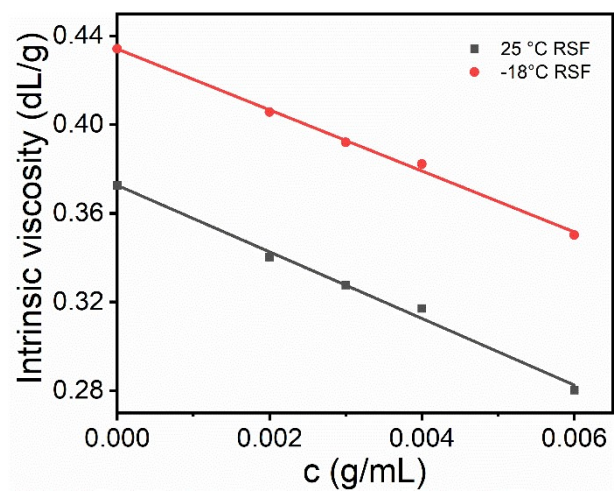


Fig. S1. The intrinsic viscosity of RSF prepared from aq. PA solutions at different temperatures.

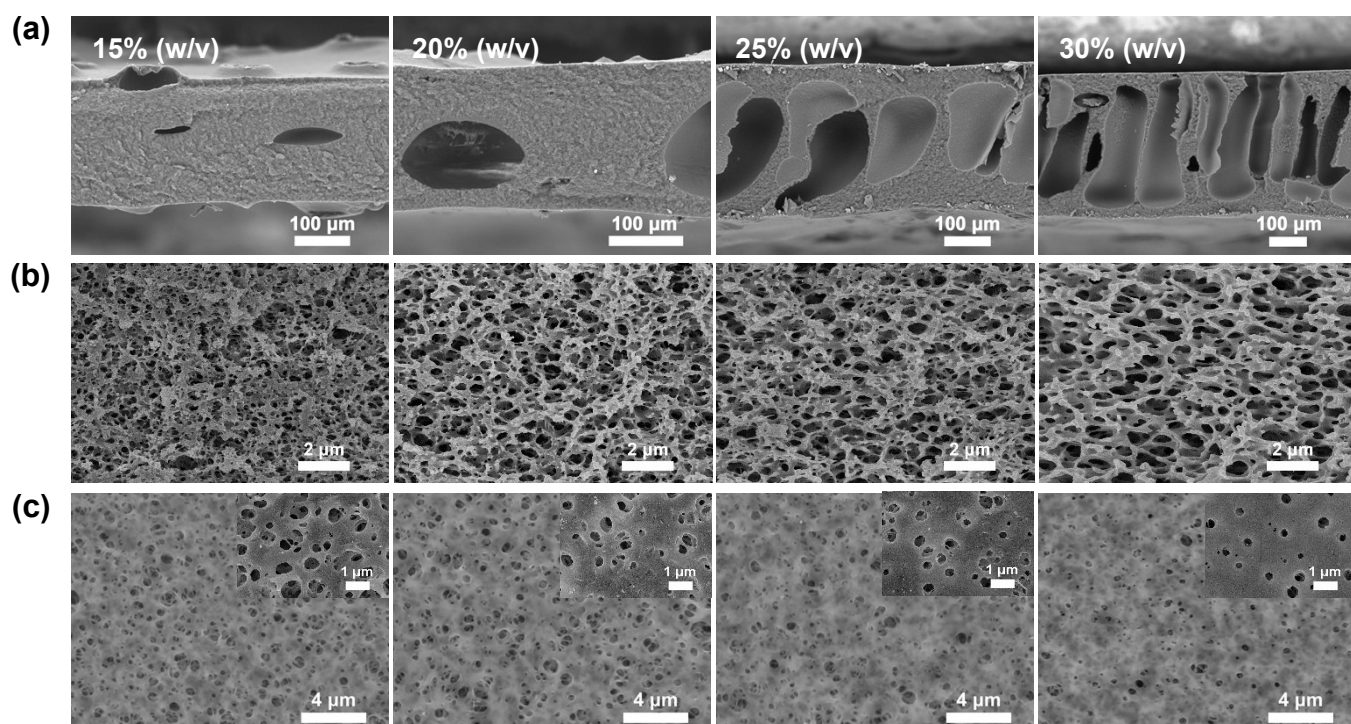


Fig. S2. SEM images of the (a, b) cross-sections and (c) surface of RSF films prepared at different $(\text{NH}_4)_2\text{SO}_4$ concentrations.

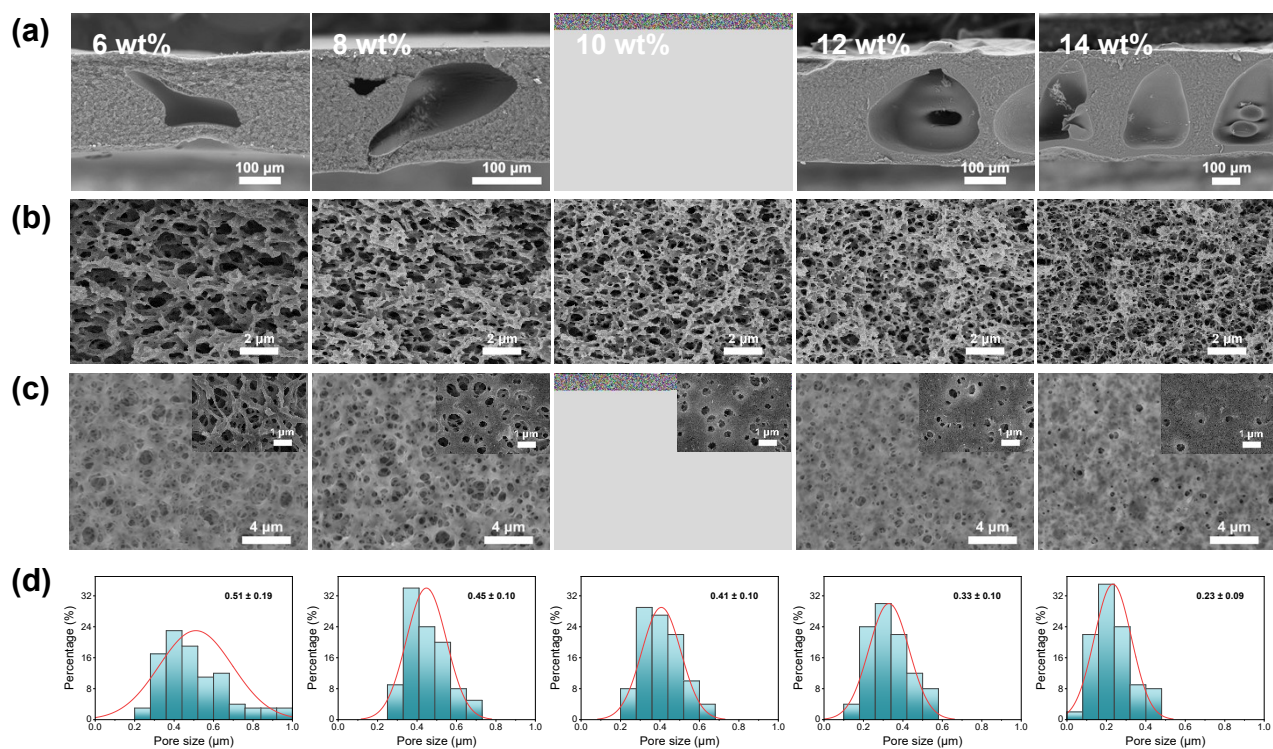


Fig. S3. The (a, b) cross-sections and (c) surface SEM images and (d) surface pore size distribution images of RSF films prepared at different SF concentrations with 20% (w/v) $(\text{NH}_4)_2\text{SO}_4$ solution.

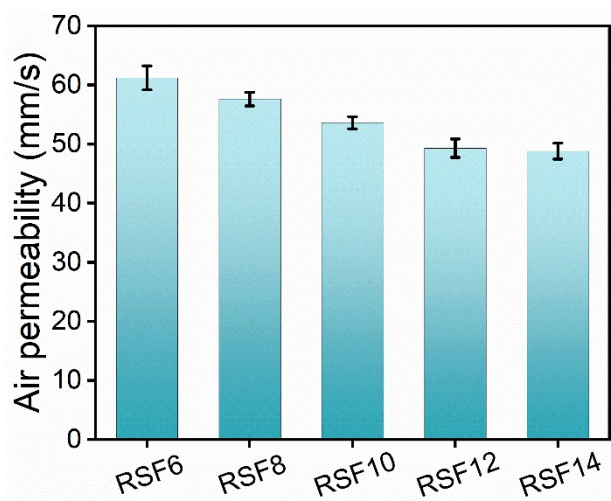


Fig. S4. Air permeability of RSF films prepared with various SF concentrations.

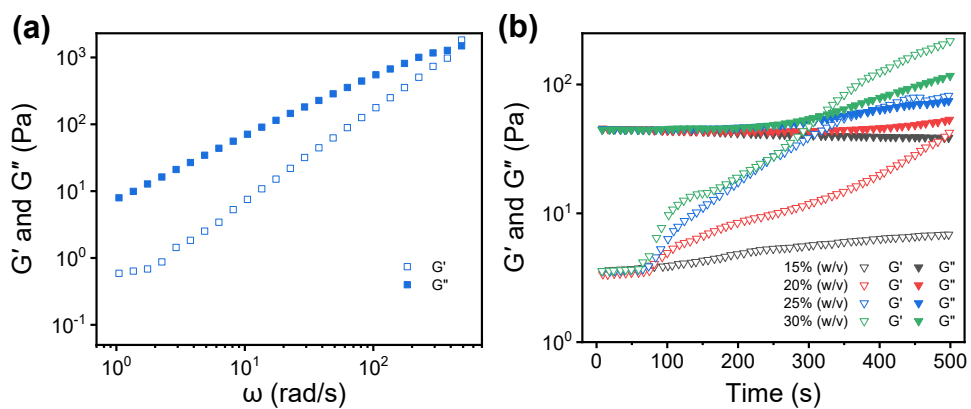


Fig. S5. (a) Modulus-angular velocity curves of 10 wt% SF solutions. (b) Time dependence of storage modulus (G') and loss modulus (G'') of a 10 wt% SF solution when adding different concentrations of regeneration bath.

Table S1. Physical properties of RSF films prepared at different SF concentrations.

Sample	C_{SF} wt%	w_{H₂O} wt%	σ_b MPa	ϵ_b %	E MPa	d μm	P %
S1	6	86.6	0.22 \pm 0.01	111 \pm 13	0.66 \pm 0.17	198	26.2
S2	8	84.2	0.34 \pm 0.03	133 \pm 14	1.09 \pm 0.19	182	19.6
S3	10	82.9	0.39 \pm 0.02	143 \pm 16	1.51 \pm 0.14	199	14.5
S4	12	81.7	0.37 \pm 0.03	130 \pm 14	1.65 \pm 0.18	260	13.3
S5	14	82.4	0.39 \pm 0.02	120 \pm 14	1.76 \pm 0.09	367	2.4

C_{SF} and C_{(NH₄)₂SO₄}: SF and (NH₄)₂SO₄ concentrations, respectively; w_{H₂O}: water content; σ_b , ϵ_b and E: tensile strength, elongation at break, and Young' s modulus, respectively; d: Thickness; P: surface porosity.

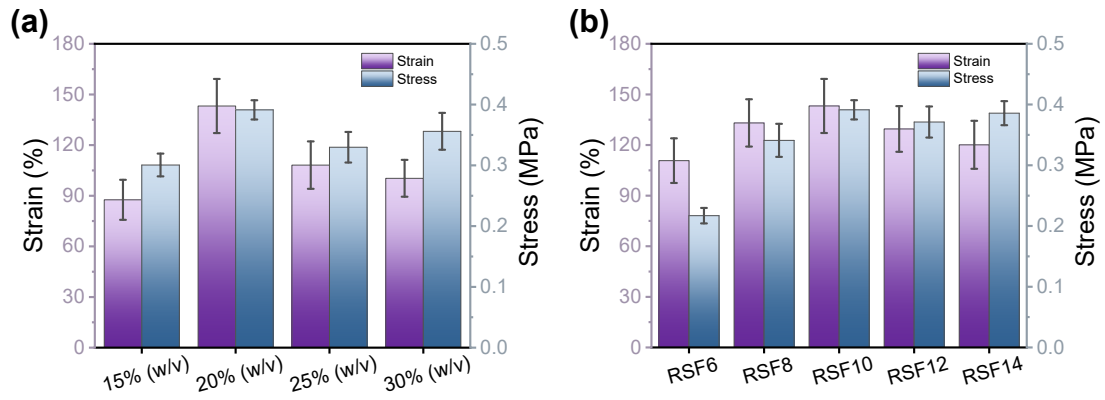


Fig. S6. Mechanical properties of wet RSF films prepared (a) at different $(\text{NH}_4)_2\text{SO}_4$ concentrations ranging from 15% (w/v) to 30% (w/v) and (b) with various SF solution concentrations ranging from 6 wt% to 14 wt%.

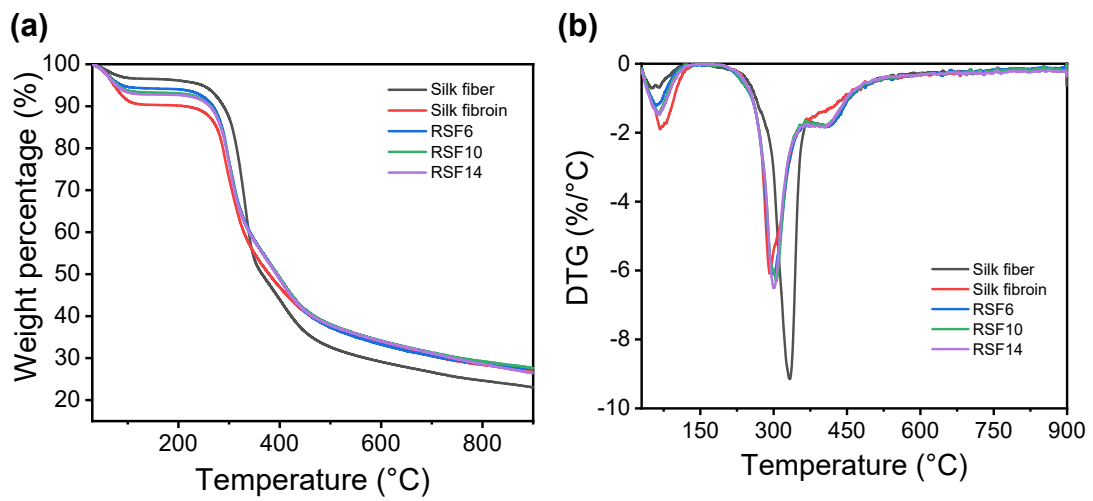


Fig. S7. (a) TG and (b) DTG curves of degummed silk fiber, lyophilized silk fibroin, and RSF films.