Supplementary Information

Facile fabrication of soy protein isolate functionalized nanofibers with enhanced biocompatibility and hemostatic effect for full thickness skin injury

Meifang Ke[a,1], Zijian Wang[b,c,1], Qi Dong[a,1], Feixiang Chen[a], Liu He[a], Céline Huselstein[d], Xinghuan Wang[b,c,*] and Yun Chen[a,*]

[a] Department of Biomedical Engineering and Hubei Province Key Laboratory of Allergy and Immune Related Disease, School of Basic Medical Sciences, Wuhan University, Wuhan 430071, P. R. China

[b] Department of Urology, Zhongnan Hospital of Wuhan University, Wuhan 430071, P. R. China

[c] Human Genetics Resource Preservation Center in Hubei, Zhongnan Hospital of Wuhan University, Wuhan 430071, P. R. China

[d] UMR 7365 CNRS, Ingénierie Moléculaire et Physiopathologie Articulaire (IMoPA), Biopôle, Université de Lorraine, 54500 Vandoeuvre-lès-Nancy, France

*Corresponding authors: Department of Urology, Zhongnan Hospital of Wuhan University, Wuhan 430071, P. R. China; Department of Biomedical Engineering and Hubei Province Key Laboratory of Allergy and Immune Related Disease, School of Basic Medical Sciences, Wuhan University, Wuhan 430071, P. R. China (Y. Chen).

E-mail: wangxinghuan@whu.edu.cn (X. Wang); yunchen@whu.edu.cn (Y. Chen).

[1]These authors contributed equally to this work.

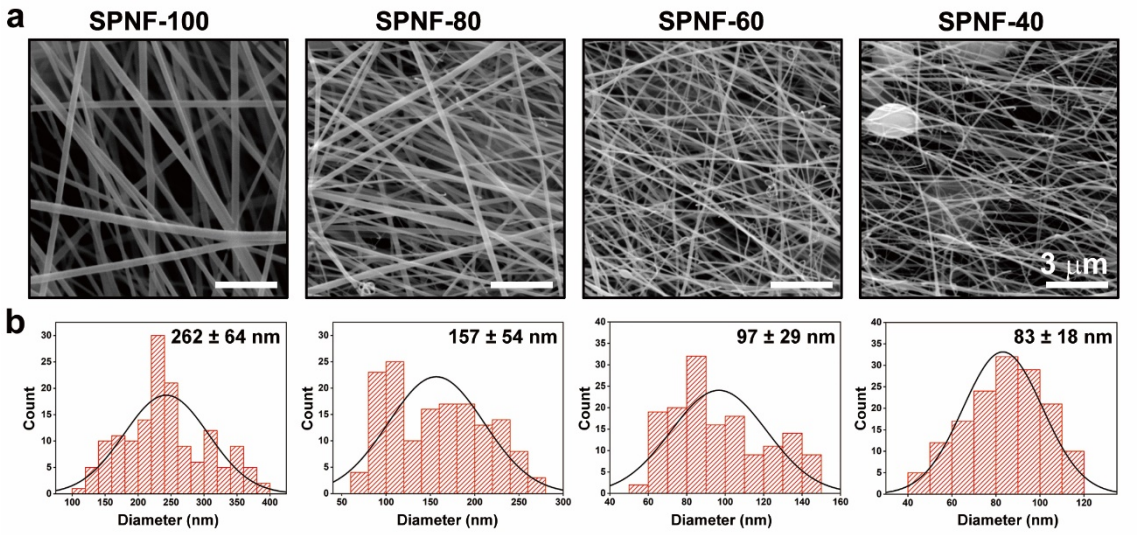

Fig. S1. Morphological observation of the SPI/PLLA nanofiber films. (a, b) SEM images and diameter distribution of the SPNF-n (n = 100, 80, 60 and 40). Scale bar: 3 μm. The electrospun nanofiber films exhibited an interwoven network structure. With the SPI content increased from 0% to 60%, the average diameter of SPNF-n significantly decreased from 262 ± 64 nm to 83 ± 18 nm ($P < 0.05$).

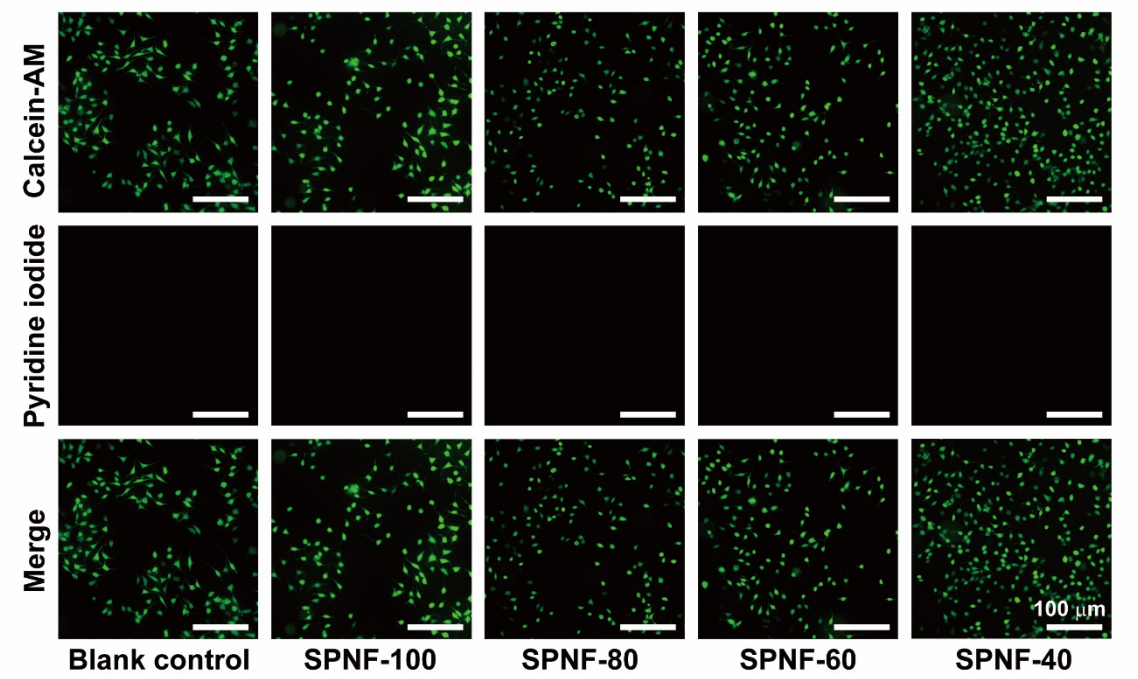

Fig. S2. Representative images of live/dead cell staining assay. Scale bar: 100 μm. Live cells were stained with calcein-AM (green) and dead cells were stained with pyridine iodide (red). L929 cells were seeded onto the upper surface of 6 well tissue culture plate, and then co-cultured with the extracts

of SPNF-n for 48 h. Almost no dead cells were found after the treatment, suggesting that SPNF-n were non-toxic to L929 cells.

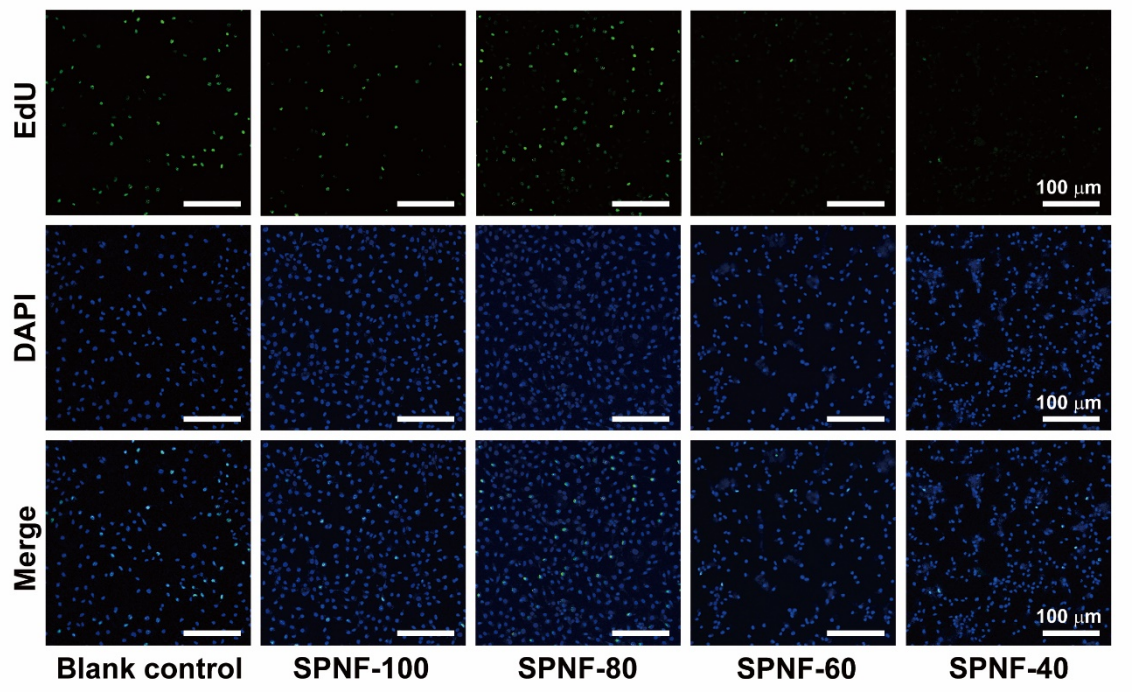

Fig. S3. EdU staining images of L929 cell after co-cultured with the extracts of SPNF-n. Blue signal: DAPI; green signal: EdU, Scale bar: 100 μm. EdU (5-Ethynyl-2 '- deoxyuridine) is a thymine nucleoside analogue, which is commonly used to detect DNA replication activity. Compared with blank control, SPNF-80 exhibited more positively stained cells, indicating that SPNF-80 was biocompatible and capable of promoting cell proliferation.

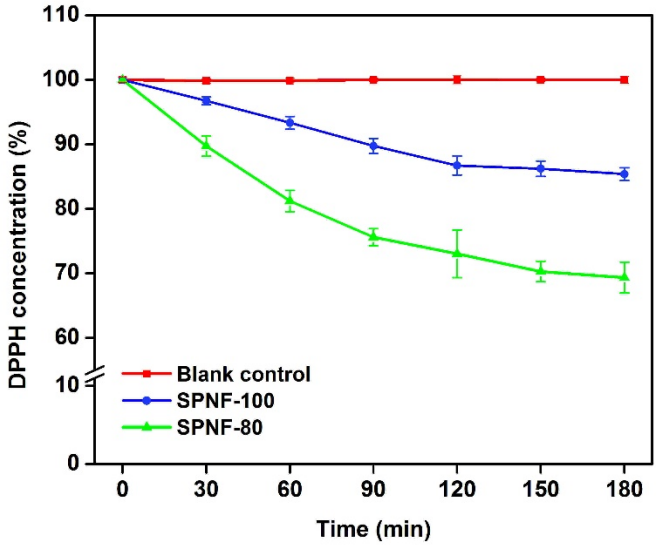

Fig. S4. DPPH radical scavenging activity of SPNF-100 and SPNF-80.

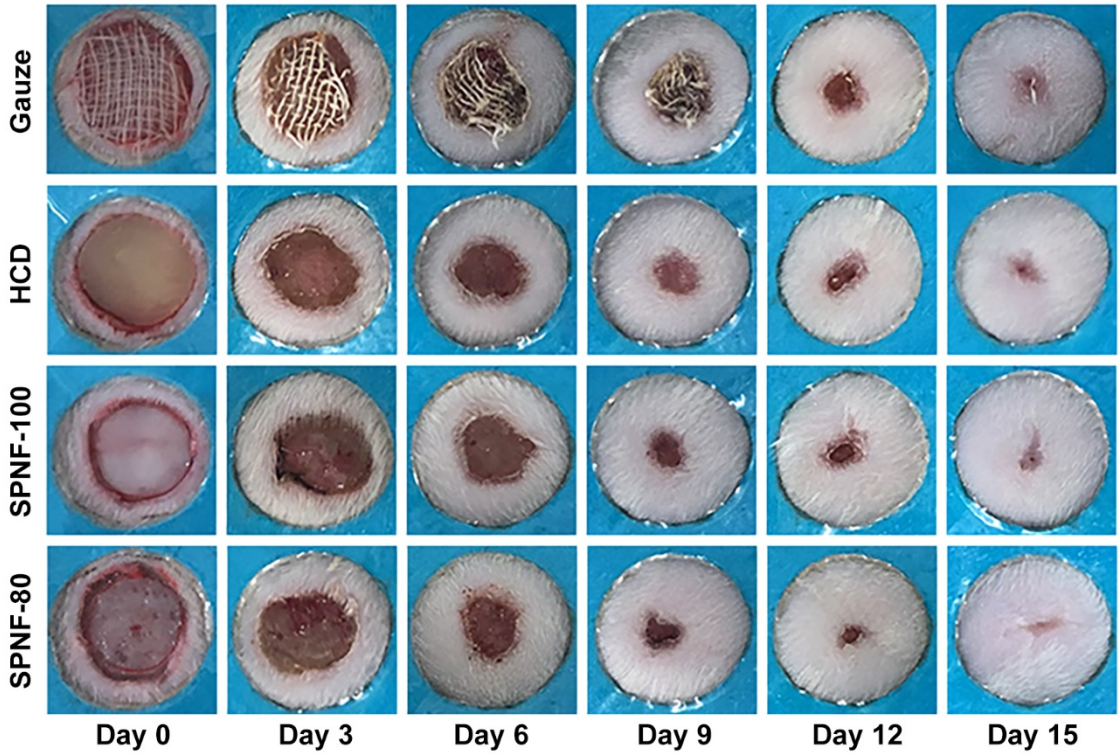

Fig. S5. Optical images of wound area in four individual groups (Gauze, HCD, SPNF-100 and SPNF-80) at 0, 3, 6, 9, 12 and 15 days after surgery. HCD: hydrocolloid dressing.

Table S1. Sample codes, compositions and preparation parameters of the SPI/PLLA nanofiber films

Codes	10 % PLLA (w/w)	2% SPI (w/w)	PLLA/SPI (w/w)	Electrode voltage	Electrode distance (cm)	Flow rate (mL/h)
SPNF-100	100	0	10:0	12 kV	11 cm	1.2 mL/h
SPNF-80	80	20	20:1	12 kV	11 cm	1.2 mL/h
SPNF-60	60	40	15:2	12 kV	11 cm	1.2 mL/h
SPNF-40	40	60	10:3	12 kV	11 cm	1.2 mL/h

Table S2. Primer sequences used for qRT-PCR

Primer name	Sequences 5'-3'	Tm
GAPDH-F	TGGATTTGGACGCATTGGTC	60.7 °C
GAPDH-R	TGGATTTGGACGCATTGGTC	60.2 °C
TNFα-F	GGAACACGTCGTGGGATAATG	60.8 °C
TNFα-R	GGCAGACTTTGGATGCTTCTT	60.6 °C
IL1β-F	GCAACTGTTCCTGAACTCAACT	60.7 °C
IL1β-R	ATCTTTTGGGGTCCGTCAACT	61.4 °C
IL4-F	GGTCTCAACCCCCAGCTAGT	62.8 °C
IL4-R	GCCGATGATCTCTCTCAAGTGAT	61.5 °C
TGFβ-F	CTTCGACGTGACAGACGCT	62.0 °C
TGFβ-R	GCAGGGGCAGTGTAAACTTATT	60.6 °C