

## Supplementary Information for

# Biodegradable Polyurethane Nerve Conduit Functionalized with NDP-MSH-Loaded Self- Assembling Peptide Hydrogel for Peripheral Nerve Regeneration

Junhong Li<sup>1, \*</sup>, Jinghan Wang<sup>2, \*</sup>, Xirui Long<sup>2</sup>, Jingjing Lin<sup>2</sup>, Mi Su<sup>3</sup>, Chang Ding<sup>4</sup>, Rongxu Lin<sup>1</sup>,  
Feng Luo<sup>2</sup>, Jiehua Li<sup>2</sup>, Yanhui Liu<sup>1</sup>, Yanchao Wang<sup>1, #</sup>, Hong Tan<sup>2</sup>

<sup>1</sup>Department of Neurosurgery, West China Hospital, Sichuan University, Chengdu, China

<sup>2</sup>College of Polymer Science and Engineering, State Key Laboratory of Advanced Polymer  
Materials, Med-X Center of Materials, Sichuan University, Chengdu, China.

<sup>3</sup>Functional Science Laboratory, West China School of Basic Medical Sciences & Forensic  
Medicine, Sichuan University, Chengdu, China

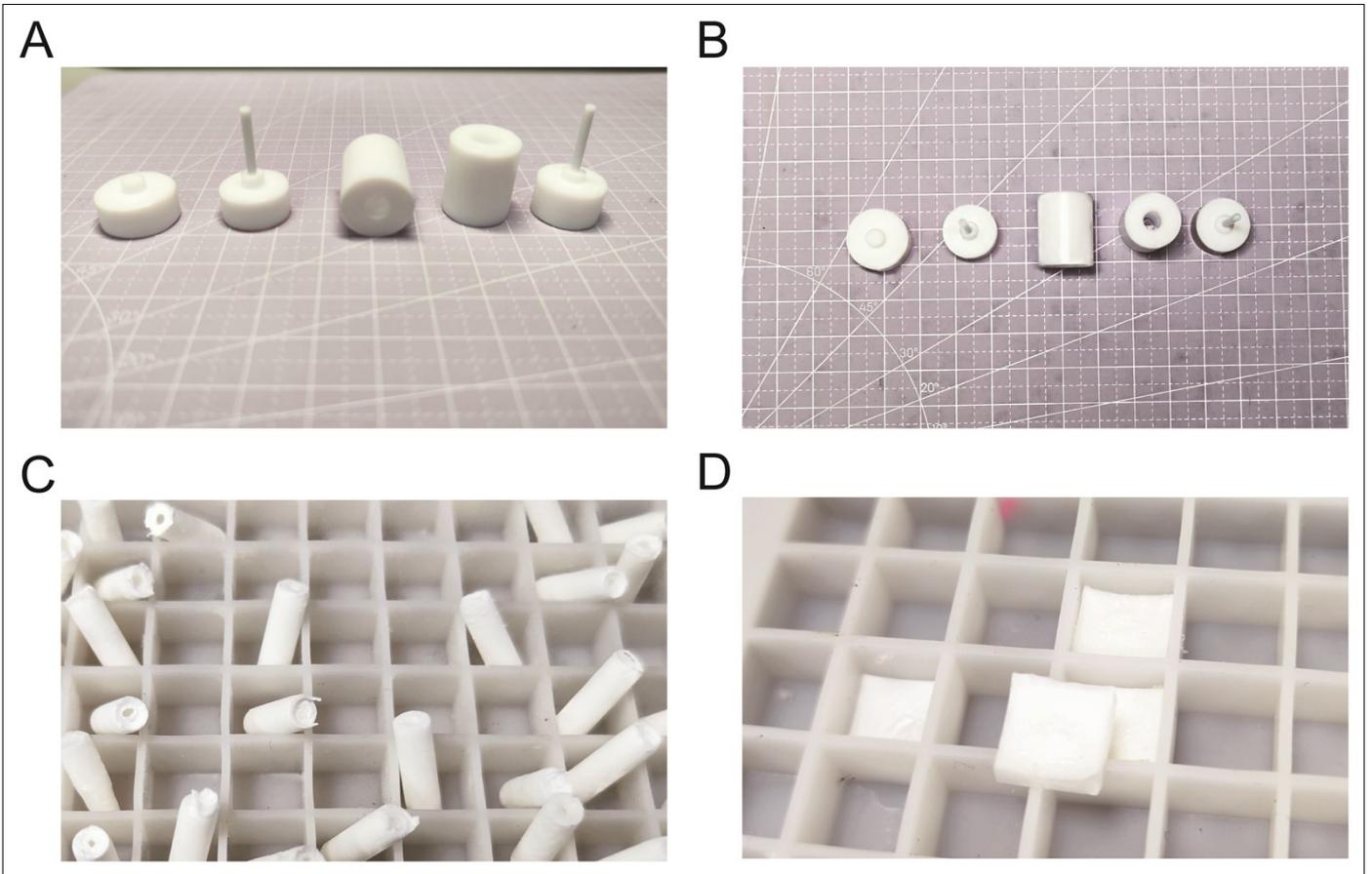
<sup>4</sup>Department of Pediatric Neurosurgery, West China Second University Hospital, Sichuan  
University, Chengdu, China

\*These authors contribute equally to this work.

#Correspondence to: Yanchao Wang, E-mail: wangyanchao@scu.edu.cn; Address: Guoxue Alley  
37, Chengdu, Sichuan Province, China.

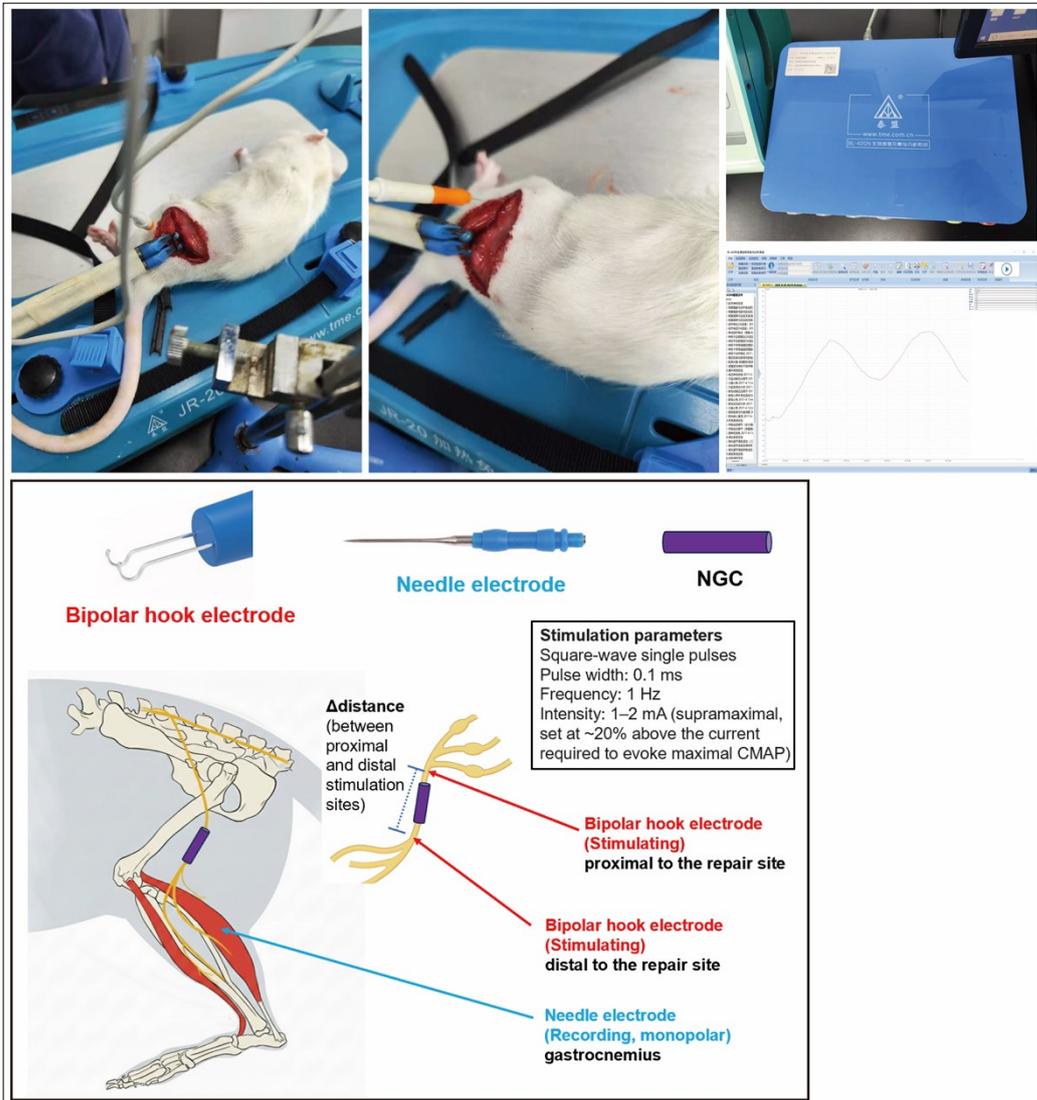
**Supplementary Table 1.** The primer sequences used for quantitative real-time PCR (qRT-PCR).

<b>Primer</b>	<b>Spicies</b>	<b>Sequence (5' to 3')</b>
Bcl2-f	rat	CAGAGGGCTACGAGTGG
Bcl2-r	rat	CAGAGCGATGTTGTCCAC
Bax-f	rat	CACTAAAGTGCCCGAGCTGA
Bax-r	rat	TCCAGATGGTGAGTGAGGCA
Hmox1 -f	rat	TCCCGAACATCGACAGCCCCA
Hmox1 -r	rat	AGGGGCAGTATCTTGCACCAGG
□		
Nrf2-f	rat	TCCTCTGCTGCCATTAGTCA
Nrf2-r	rat	GTGCCTTCAGTGTGCTTCTG
Nqo1-f	rat	TCCAGAAACGACATCACAGG
Nqo1-r	rat	AGCTACAATATCCGGGCTCA
□		
Gapdh-f	rat	CATGGCCTTCCGTGTTCCCTA
Gapdh-r	rat	GCCTGCTTCACCACCTTCTT

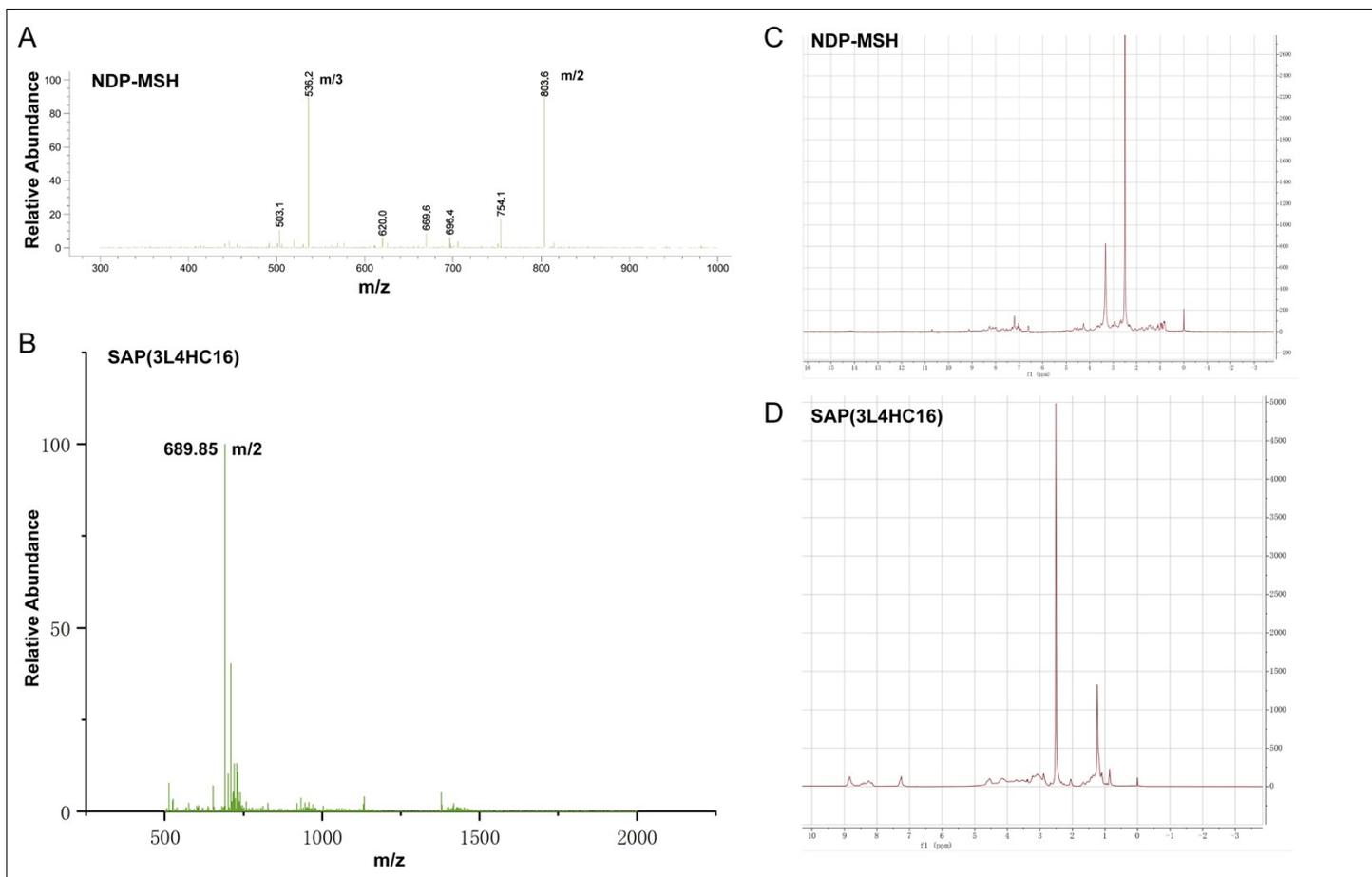


**Supplementary Figure 1.** Supplementary Figure 1. Fabrication fixtures and freeze-dried forms of BWPU constructs.

(A–B) Custom polyethylene (PE) molds used to cast BWPU nerve guidance conduits (NGCs) and sheet scaffolds. (C) Representative BWPU NGC after lyophilization (freeze-drying). (D) Representative BWPU sheet scaffold after lyophilization.

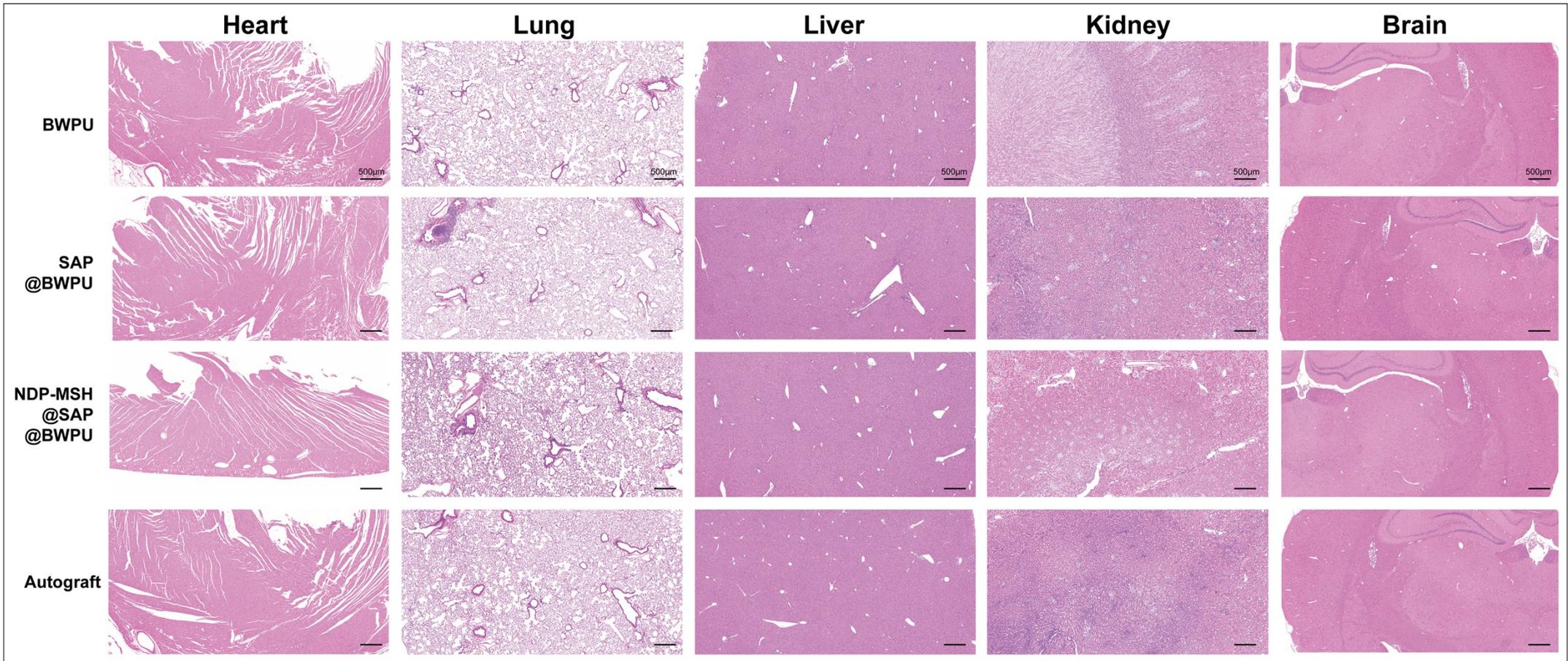


**Supplementary Figure 2.** Schematic overview of the electrophysiological assessment of compound muscle action potential (CMAP) and nerve conduction velocity (NCV).



**Supplementary Figure 3.** Mass Spectra and Nuclear Magnetic Resonance (NMR) Analysis of NDP-MSH and SAP (3L4HC16).

(A) Mass spectrum of NDP-MSH. (B) Mass spectrum of SAP (3L4HC16). (C) NMR spectrum of NDP-MSH. (D) NMR spectrum of SAP (3L4HC16).



**Supplementary Figure 4.** Representative H&E staining of major organs.

Heart, liver, lung, kidney, and brain collected on postoperative day 60 from rats treated with BWPU, SAP@BWPU, NDP-MSH@SAP@BWPU conduits, or autograft (n = 3 per group). Paraffin sections (4  $\mu$ m) were H&E-stained and digitally scanned. No overt histopathological abnormalities were observed across groups. Scale bars as indicated.

Supplementary Material 1  $^1$ H NMR of NDP-MSH and SAP (3L4HC16).