Supporting Information

Integration of genetically engineered virus nanofibers and fibrin to form injectable fibrous neuron-rich hydrogels and enable neural differentiation

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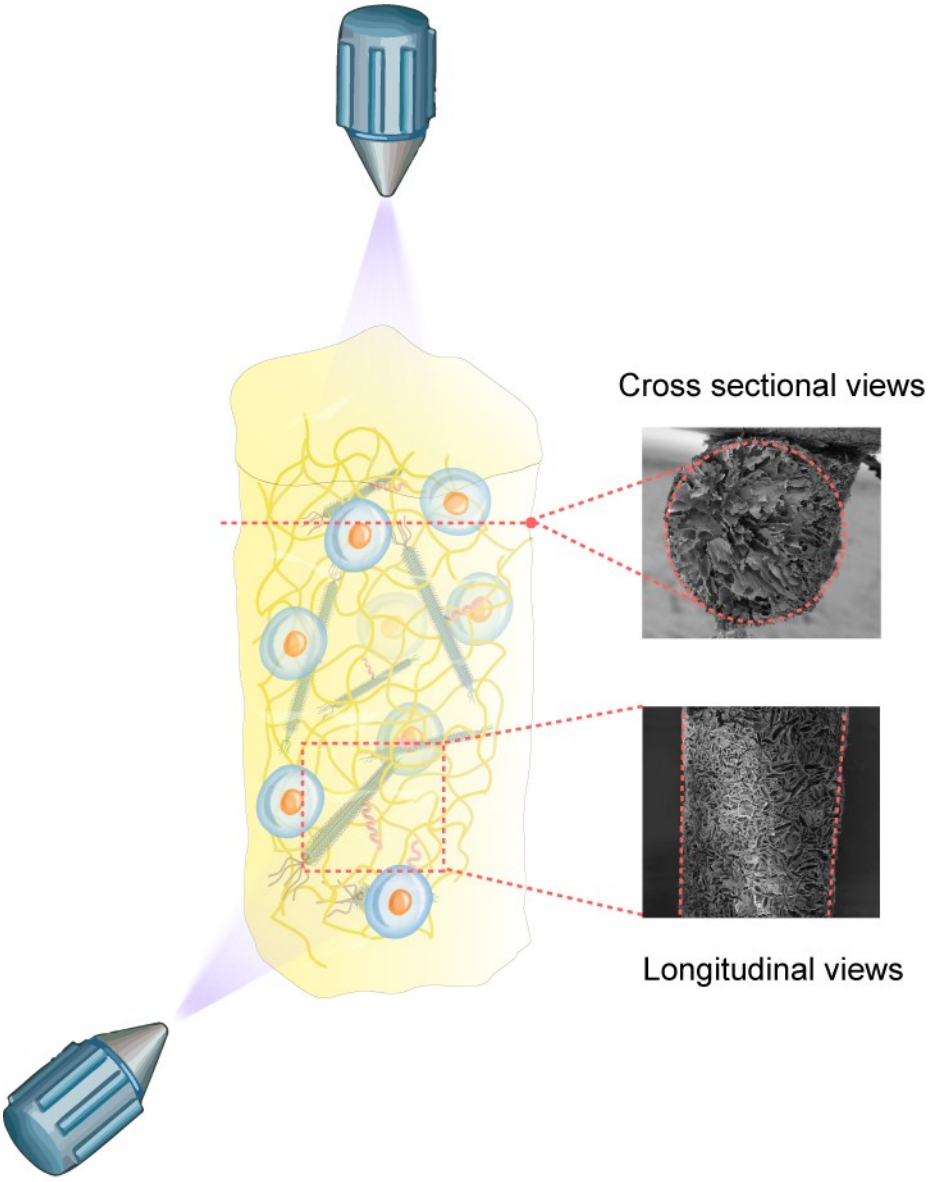

Fig. S1 Schematic diagram showing the cross sectional and longitudinal views of R-phage/FG imaged by scanning electron microscope (SEM).

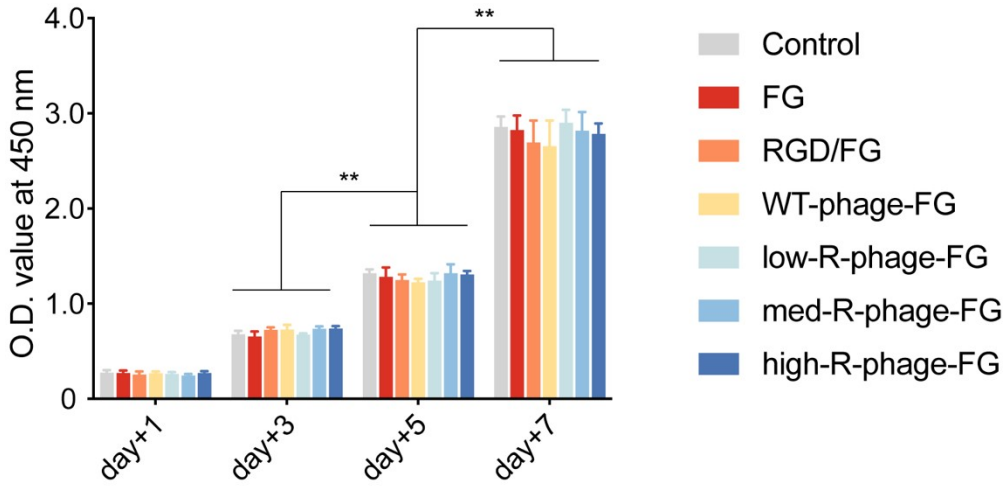

Fig. S2 In vitro biocompatibility evaluation of hydrogels by incubating with NSCs for 1, 3, 5 and 7 days via Cell Counting kit-8 (CCK-8) test. The amount of phage loaded on the hydrogels was 5.56×10^6 PFU g^{-1} in low-R-phage/FG, 2.27×10^7 PFU g^{-1} in med-R-phage/FG, and 1.11×10^8 PFU g^{-1} in high-R-phage/FG. Comparisons between groups were evaluated using parametric one-way analysis of variance (ANOVA) followed by Tukey's post-hoc test. *$P < 0.05$, **$P < 0.005$.

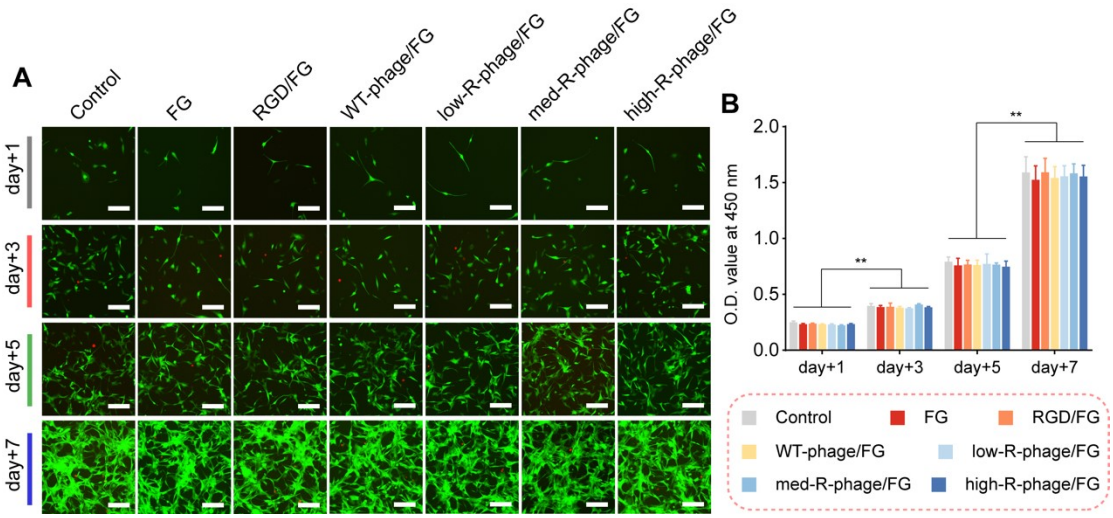

Fig. S3 In vitro biocompatibility evaluation of hydrogels. (A) Live/Dead staining of astrocytes after astrocytes were incubated with hydrogels for 1, 3, 5 and 7 days. Live cells and dead cells were stained by Calcein-AM (green) and ethidium homodimer (red), respectively. (B) Cell Counting kit-8 (CCK-8) test. The amount of phage loaded on the hydrogels was 5.56×10^6 PFU g^{-1} in low-R-phage/FG, 2.27×10^7 PFU g^{-1} in med-R-phage/FG, and 1.11×10^8 PFU g^{-1} in high-R-phage/FG. Comparisons between groups were evaluated using parametric one-way analysis of variance (ANOVA) followed by Tukey's post-hoc test. *$P < 0.05$, **$P < 0.005$. Scale bar represents 100 μm.

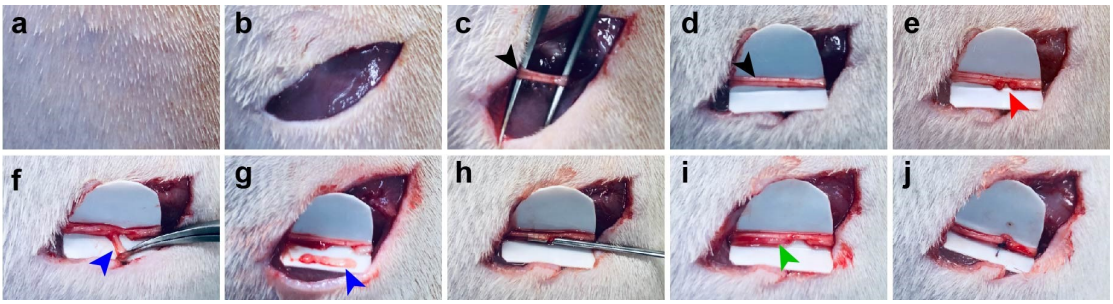

Fig. S4 The surgical procedure of repairing the large-gap sciatic nerve in the right lag of rats by injecting R-phage/FG. (a) Skin of rat right legs after shaving and sterilization, (b) the exposed skin and muscle of rats. (c, d) The exposed natural sciatic nerve. (e) The epineurium notch of sciatic nerve in rats. (f) One end of the sciatic nerve is cut off from the epineurium. (g) The 10 mm sciatic nerve defect. (h) The R-phage/FG is injected to connect the proximal and distal ends of the broken nerve. (i) The implanted R-phage/FG gradually coagulates in the epineurium of the sciatic nerve. (j) After the hydrogel is completely solidified, the epineurium of the nerve is sutured. The black arrow represents the sciatic nerve in the rat leg, the red arrow represents the gap in the epineurium, the blue arrow represents the severed nerve, and the green arrow represents the injected hydrogel.

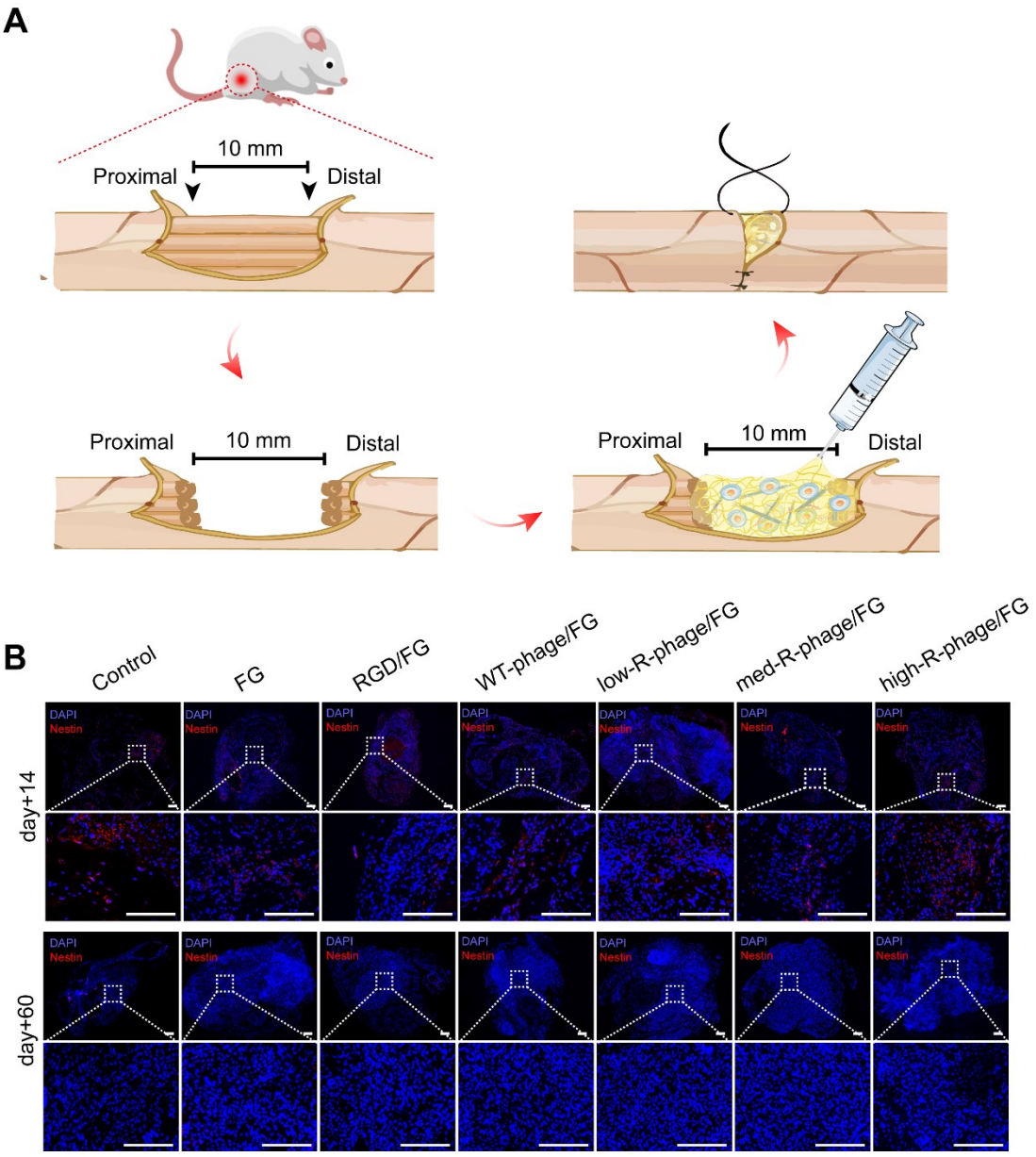

Fig. S5 The differentiation evaluation in long-gap (10 mm) nerve defect of rat model. (A) Schematic illustration of the steps of the surgical procedure. The black arrows represent the site of nerve transection. (B) Fluorescent micrographs of NSCs (nestin-positive cell, red) in distal cross sections of the regenerated nerves 14 days and 60 days after hydrogels injection. Scale bar represents 100 μm.