

## Supplementary information

### Bioadhesive Anisotropic Nanogrooved Microfibers Directing Three-dimensional Neurite Extension

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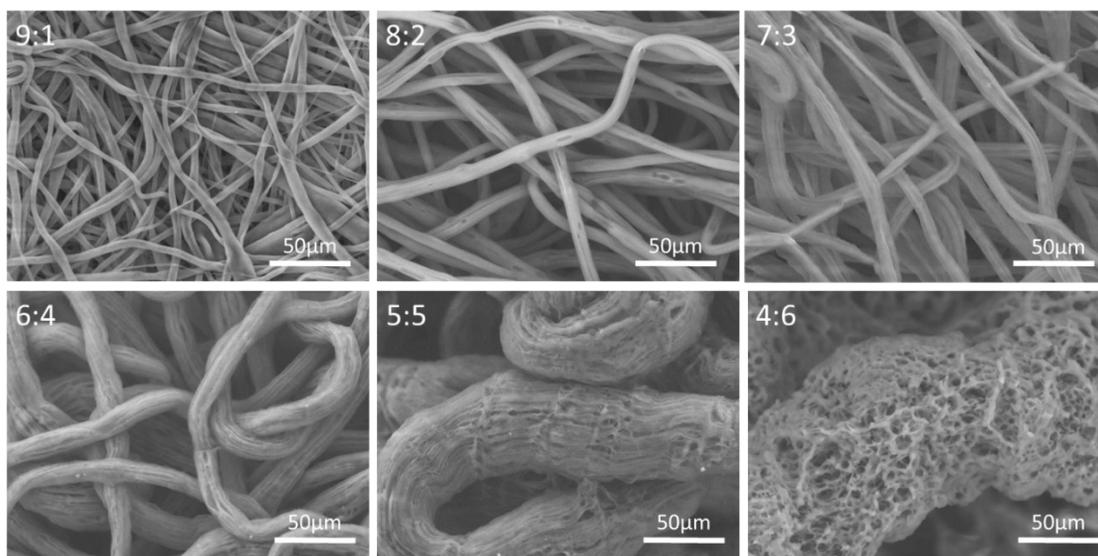


Figure S1. SEM images of 20%PCL/6%PEO microfibers electrospun with different volume ratios. In 9:1 group, fibers presented smooth surface and with the increase of PEO, fiber surface became rougher. Longitudinal grooves gradually appeared at 7:3 group and 6:4 group, where 6:4 group showed clearer and deeper grooves. With further increased PEO content, transverse lamellae structures appeared and co-existed with longitudinal grooves (5:5 group). At 4:6 group,

even more random transverse structures were present, making the microfibers porous and loose.  
Scale bar: 50  $\mu\text{m}$ .

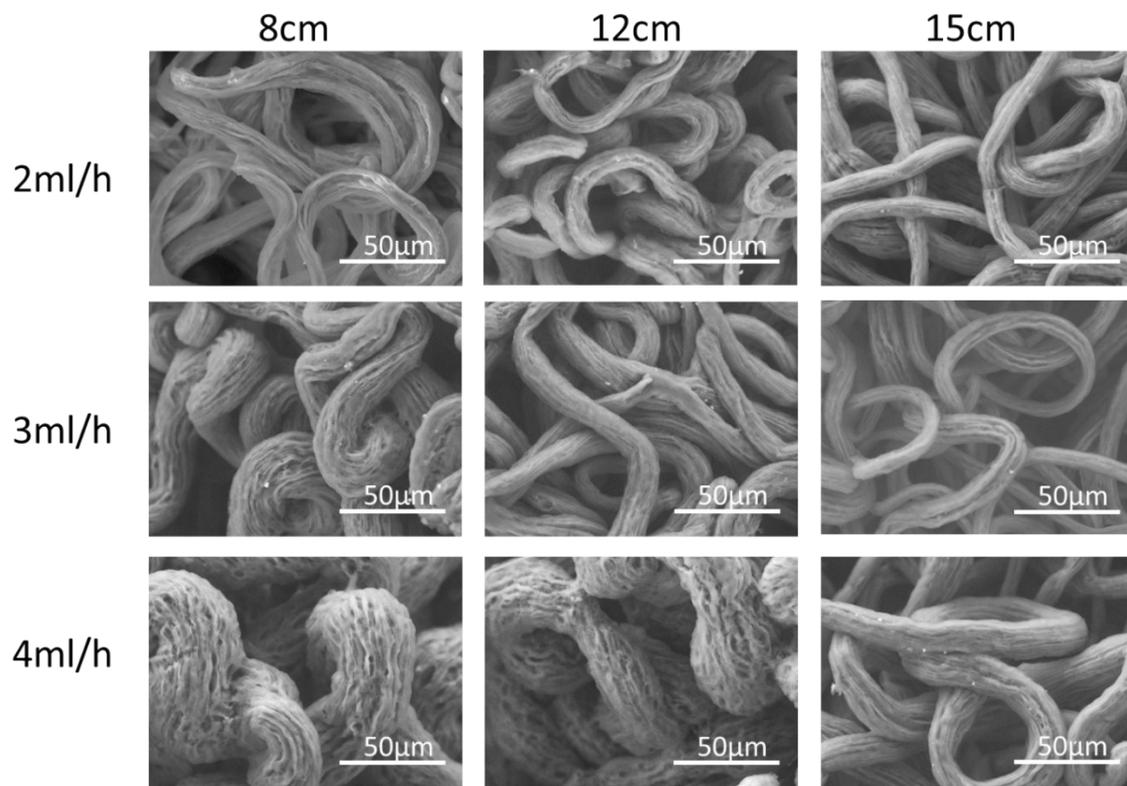


Figure S2. SEM images of GF electrospun with different parameters, flow rates range from 2 mL/h to 4 mL/h, distances range from 8 cm to 15 cm. Microfibers electrospun at 15 cm and 4 mL/h showed clearer and deeper nanogrooves. Scale bar: 50  $\mu\text{m}$ .

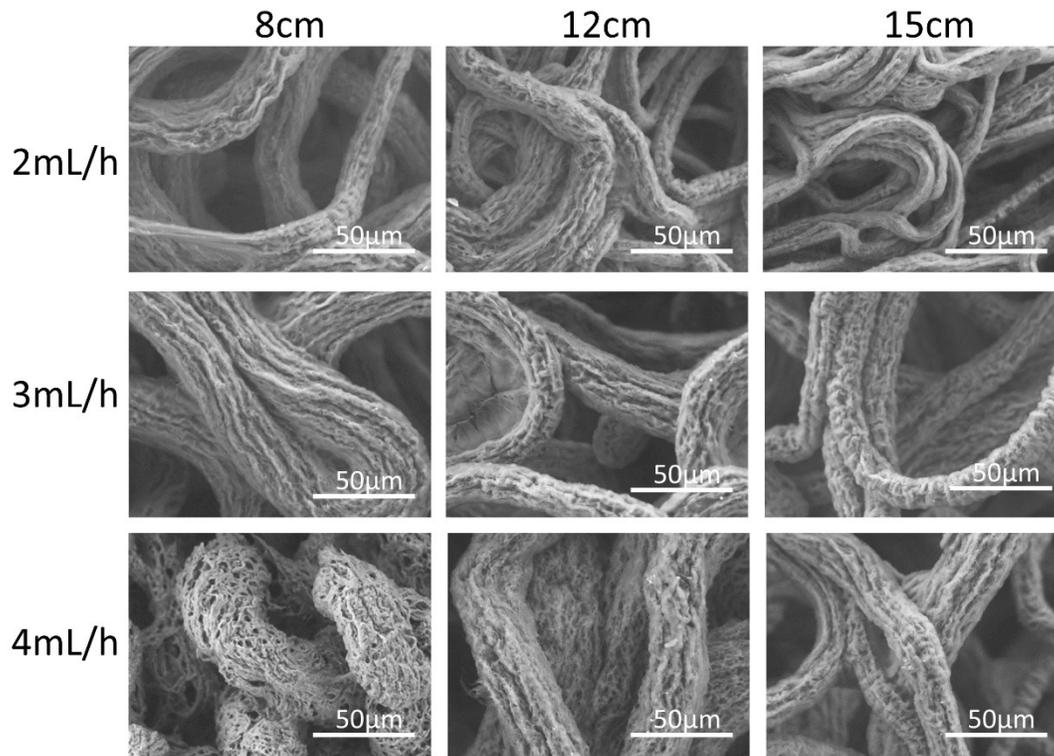


Figure S3. SEM images of RF electrospun with different parameters, flow rates range from 2 mL/h to 4 mL/h, distances range from 8 cm to 15 cm. Microfibers electrospun at 8 cm and 2 mL/h showed more random and rougher surface. Scale bar: 50 μm.

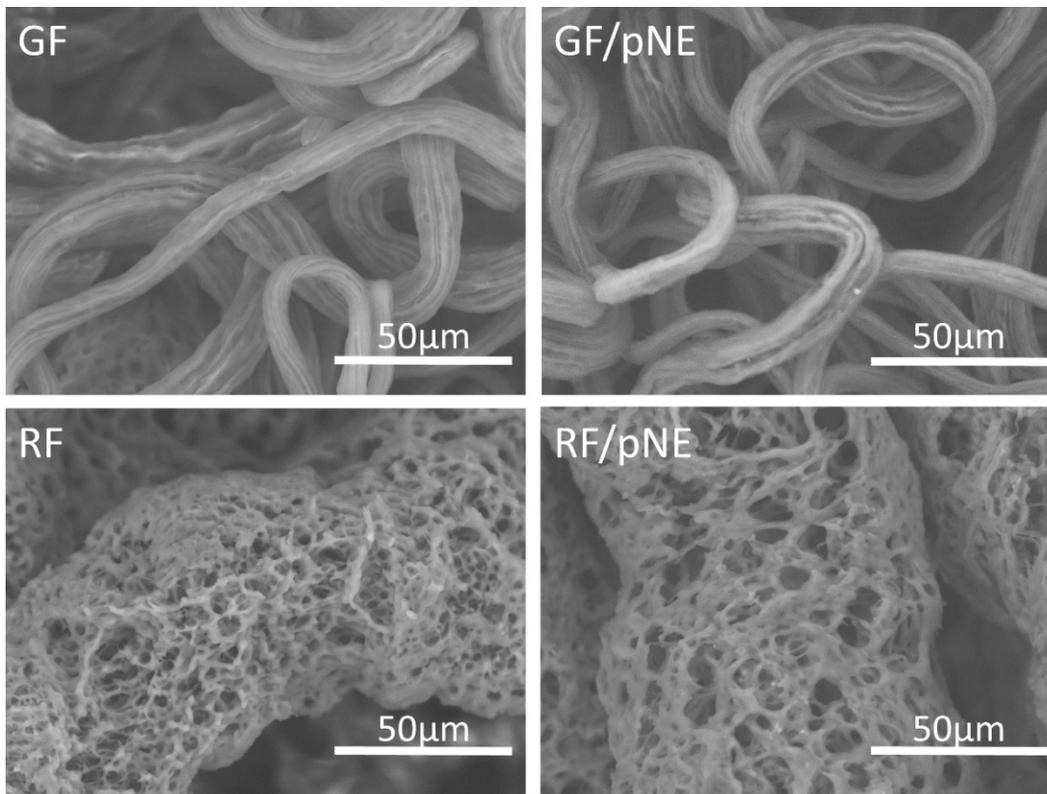


Figure S4. SEM images of GF, GF/pNE, RF and RF/pNE. No obvious morphology change could be observed between uncoated fibers and pNE-coated fibers. Scale bar: 50  $\mu\text{m}$ .

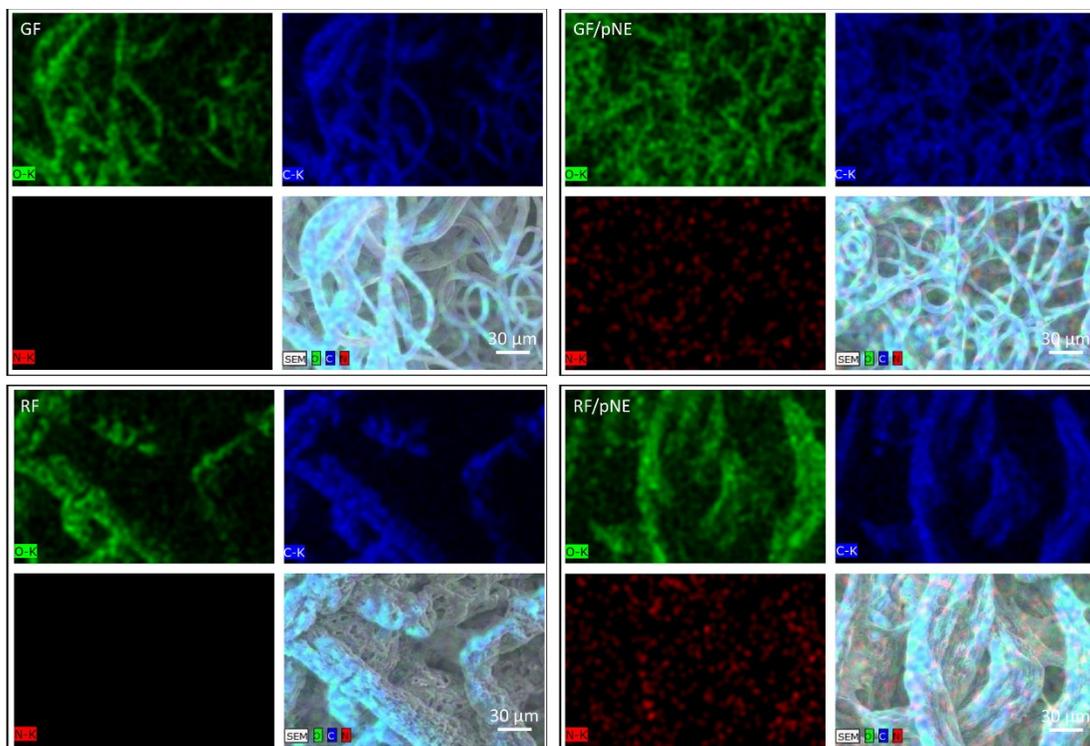


Figure S5. Element mapping images of GF, GF/pNE, RF and RF/pNE assessed by EDS. N element was seen distributed evenly on pNE coated fibers. Colors: green, O; blue, C; red, N.

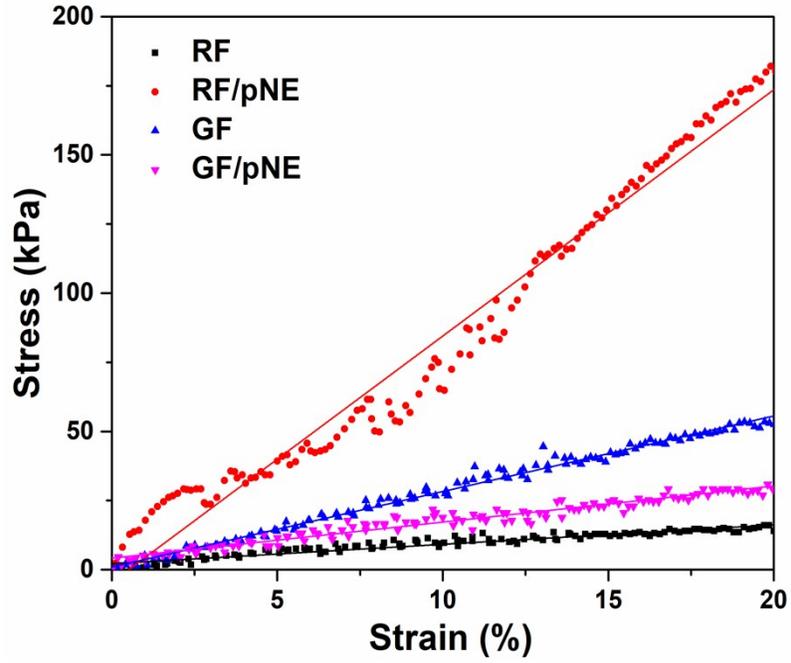


Figure S6. Stress–strain curves of RF, RF/pNE, GF, and GF/pNE.