Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

A General Strategy for Generating Gradients of Bioactive Proteins on Electrospun Nanofiber Mats by Masking with Bovine Serum Albumin

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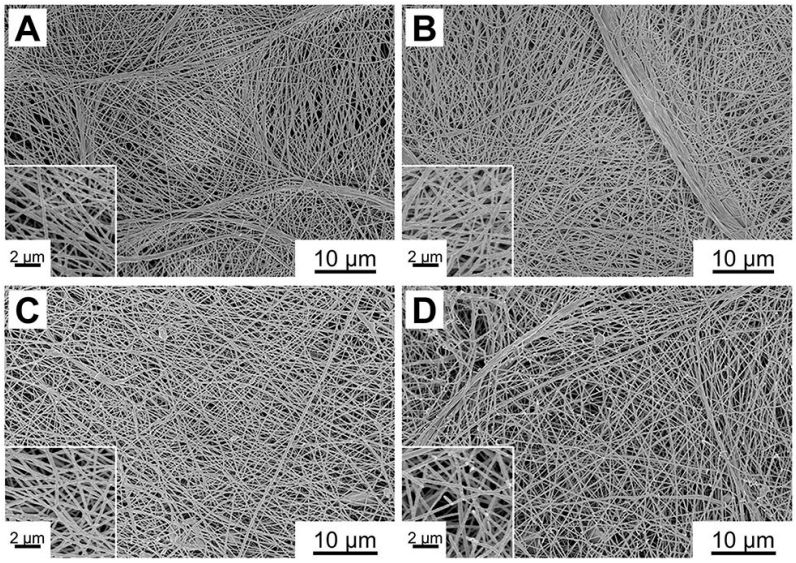

Figure S1. SEM images of random PCL nanofibers after being exposed to plasma treatment for (A) 0.5, (B) 1, (C) 2, and (D) 5 min, respectively.

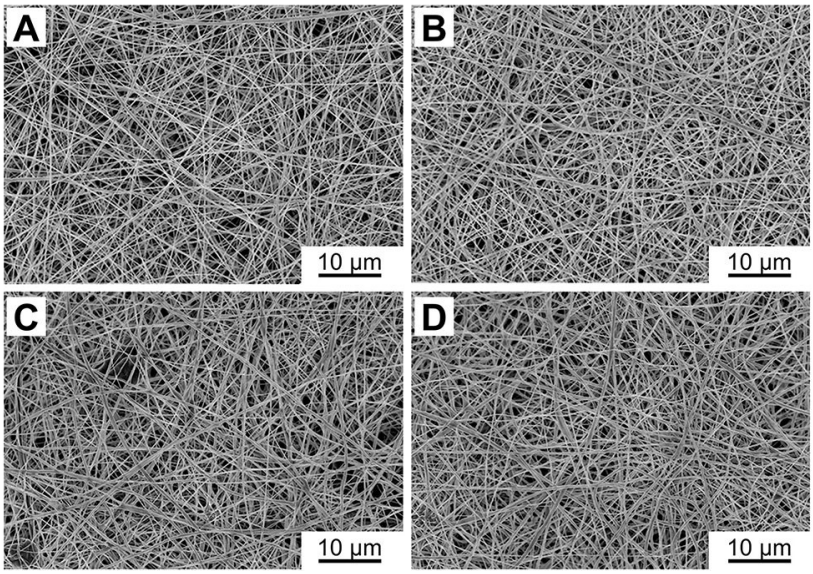

Figure S2. SEM images of PCL nanofibers (A) before and (B–D) after being soaked in (B) PBS, (C) 0.1% BSA, and (D) 0.5% BSA, respectively, for 1 h.

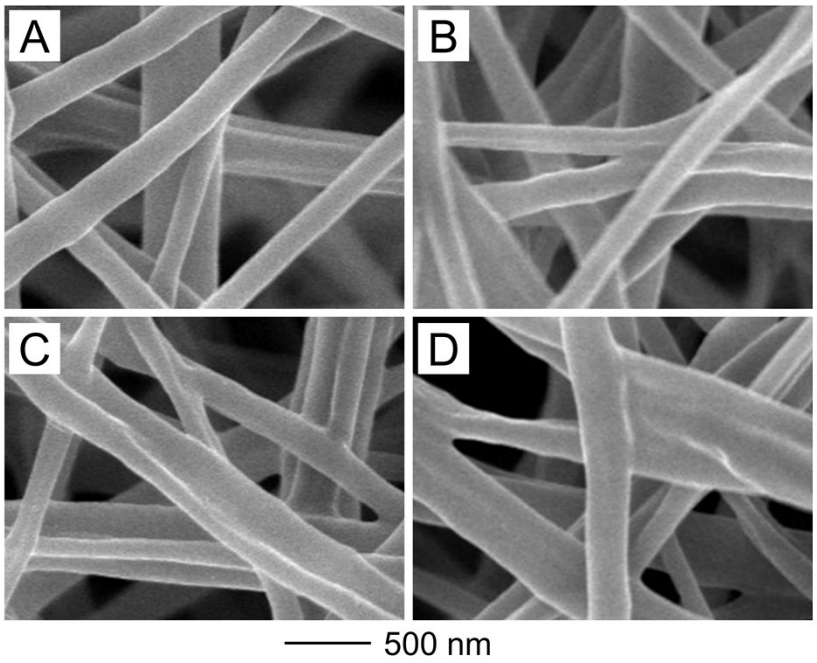

Figure S3. SEM images of PCL nanofibers (A) before and (B–D) after being soaked in (B) PBS, (C) 0.1% BSA, and (D) 0.5% BSA, respectively, for 1 h.

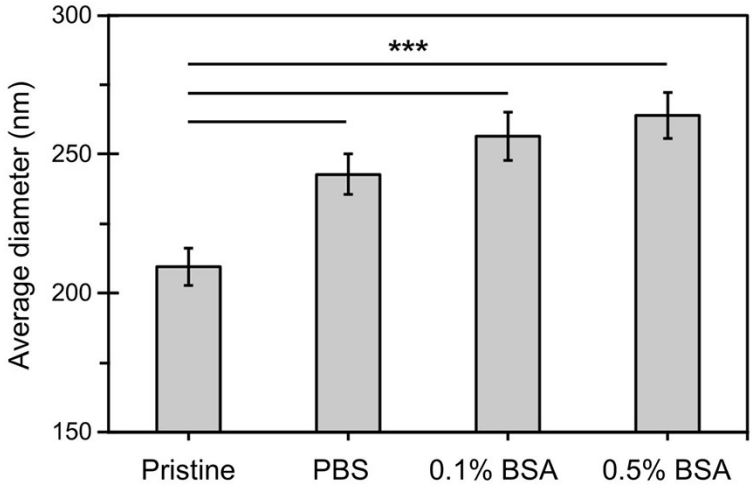

Figure S4. Average diameters of the pristine PCL nanofibers and the same batch of nanofibers after being O_2-plasma treated for 2 min, followed by separately soaking in PBS, 0.1% BSA, and 0.5% BSA, respectively, for 1 h. ***$P < 0.001$ when compared to pristine fibers.

Figure S5. Water drops on the surfaces of (A) pristine PCL nanofibers, (B) PCL nanofibers after being exposed to O_2-plasma for 2 min, and (C) PCL nanofibers after being soaked in 0.1% BSA solution for 1 h.

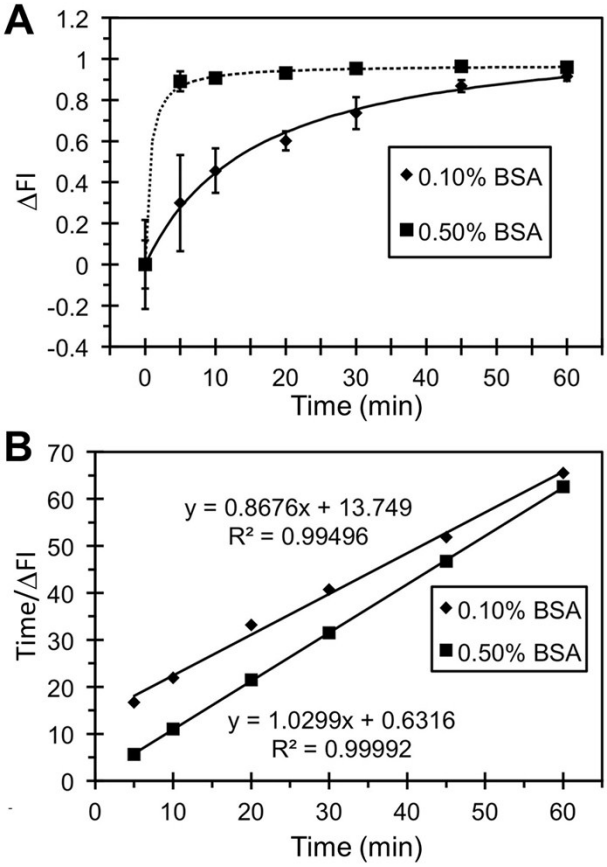

Figure S6. (A) Plots showing the net difference in fluorescence intensity (ΔFI) over time when the nanofibers were subjected to 0.1% BSA and 0.5% BSA solutions for different durations of time, indicating the actual time course of BSA adsorption. (B) Plots of the time/ΔFI over time which was linearized by a Hanes-Woolf transform and fitted with a straight line. Using the slope and intercept of the fits, the saturation point (c_{max}) and the time to half saturation (T_m) can be calculated.

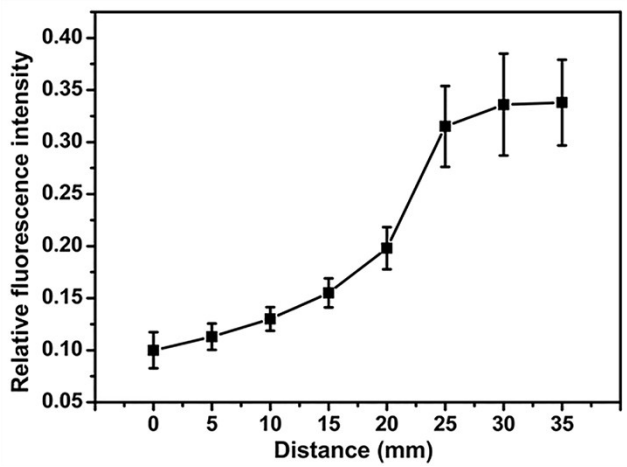

Figure S7. Relative fluorescence intensities at different positions of nanofiber strips by varying the duration of contact time with a 0.1% BSA-FITC solution over a distance of 35 mm (n=9 at each position). A gradient in BSA-FITC can be clearly seen across the strips of nanofibers.

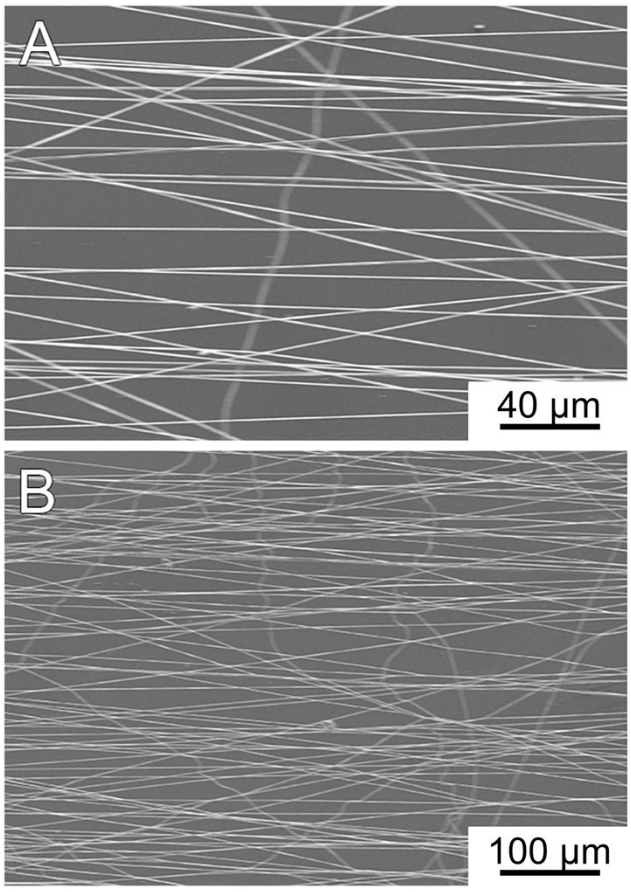

Figure S8. SEM images of the uniaxially aligned PCL nanofibers at different magnifications.

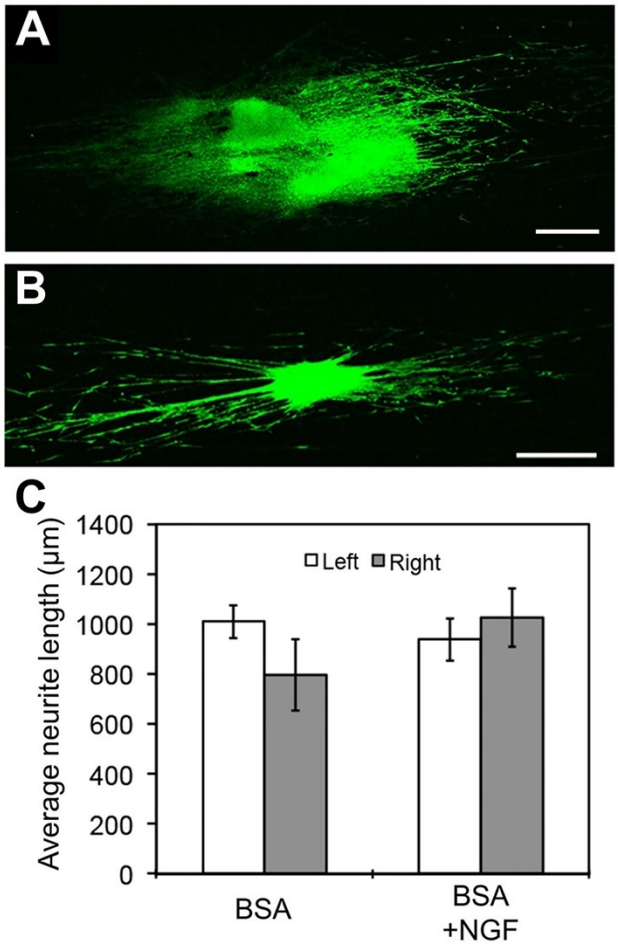

Figure S9. (A, B) Fluorescence micrographs of the neurites extending from DRG when cultured on BSA-blocked PCL nanofibers in the (A) absence and (B) presence of NGF in the culture media. The neurites were stained with anti-neurofilament 200 (green). Scale bars: 500 μm. (C) The average lengths of the neurites extending from the left side (decreasing of NGF concentration) and the right side (increasing of NGF concentration) of the DRG mass when cultured on BSA-blocked PCL nanofibers in the absence (BSA) or presence (BSA+NGF) of free NGF in the culture media, showing no significant differences.