Appendix

FTIR measurement on silk films with an without methanol treatment

The secondary structures of silk films were determined using FTIR spectrometry (Nicolet 5700, USA) for measurement in the reflection mode. The measurement range was 1200-1800 cm^{-1}. The incident beam wavelength was 0.154 nm. The secondary structures present in the films, including random coils, alpha-helices, beta-sheets and beta-turns, were evaluated using software (peakfit 4.12) through Fourier self-deconvolution (FSD) of the infrared absorbance spectra, with a focus on the amide I region (1595 - 1705 cm^{-1}).

A 100 μL aliquot of silk solution at 3% and 6% was pipetted into a 24-well plate. The samples were dried in the fume hood overnight. After drying, 1 ml methanol was added into half of the wells and the samples were incubated for 2 hrs before being dried in the fume hood. Both the methanol-treated and untreated film were subjected to FTIR measurement as described in the Materials and Methods. The same amount of silk solution (3%, 100 μL each well) were also lyophilized and subjected to FTIR.

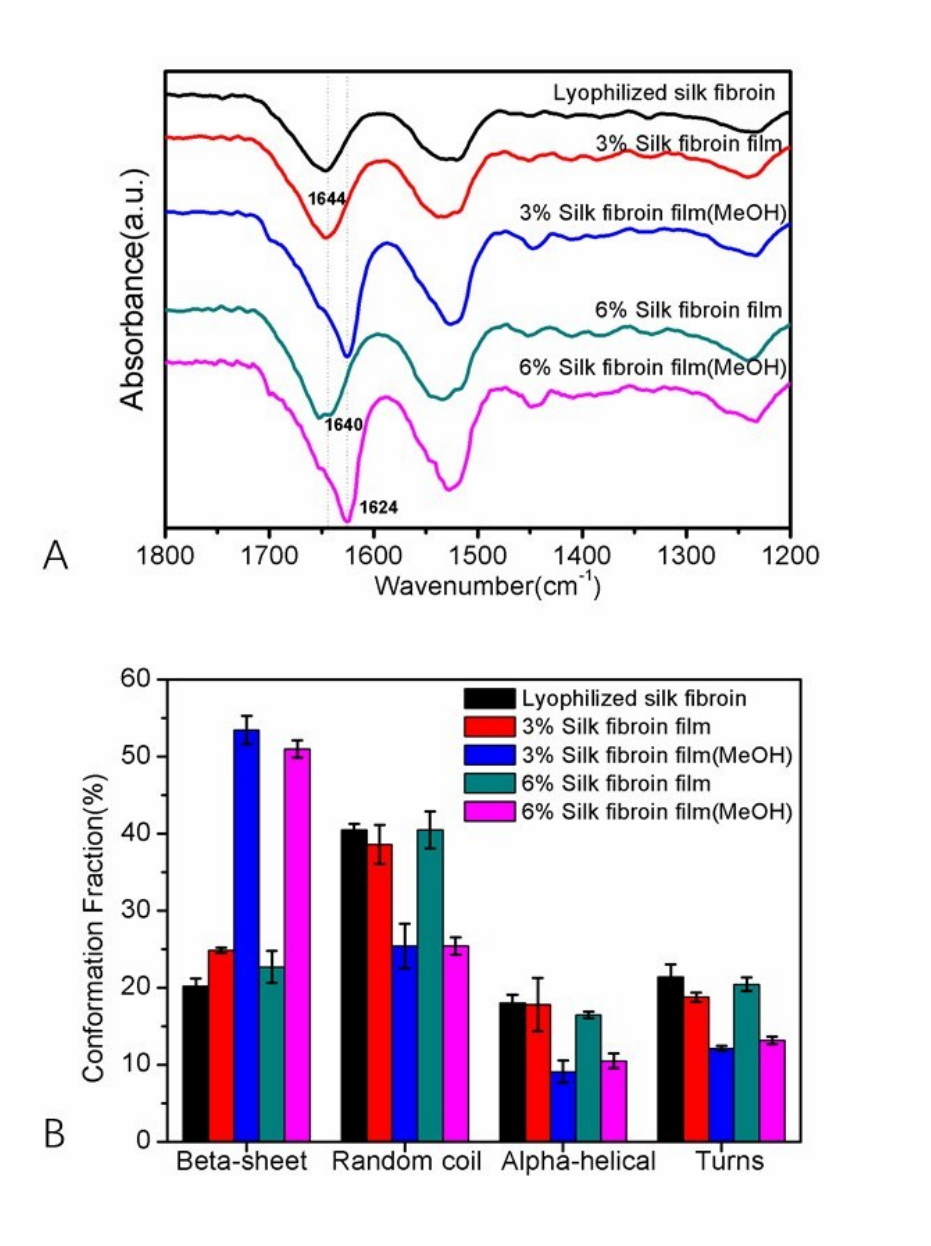

FIGURE S1. FTIR measurement on methanol-treated and untreated silk films. Lyophilized silk served as control. A, FTIR spectra showing the absorbance peaks at Amide I and II regions. B, secondary contents calculated based on the Amide I peaks after Fourier deconvolution.

DNA extraction from the pre-treated filter paper with DNA deposited directly

A 100 µL aliquot of silk solution at 1, 3, 6% was pipetted on the filter paper placed in the 24-well plates. The samples were dried in the fume hood overnight. After drying, 1 mL methanol was added into each well and the samples were incubated for 2 hrs before being dried in the fume hood. The DNA solution (96 ng/µL, 40 µL) was pipetted on the dried filter paper. The 24-well plates were placed in the fume hood overnight until the solution dried completely. The samples prepared using post-treatment deposition method are referred to as DNA+silk-PT-filter.

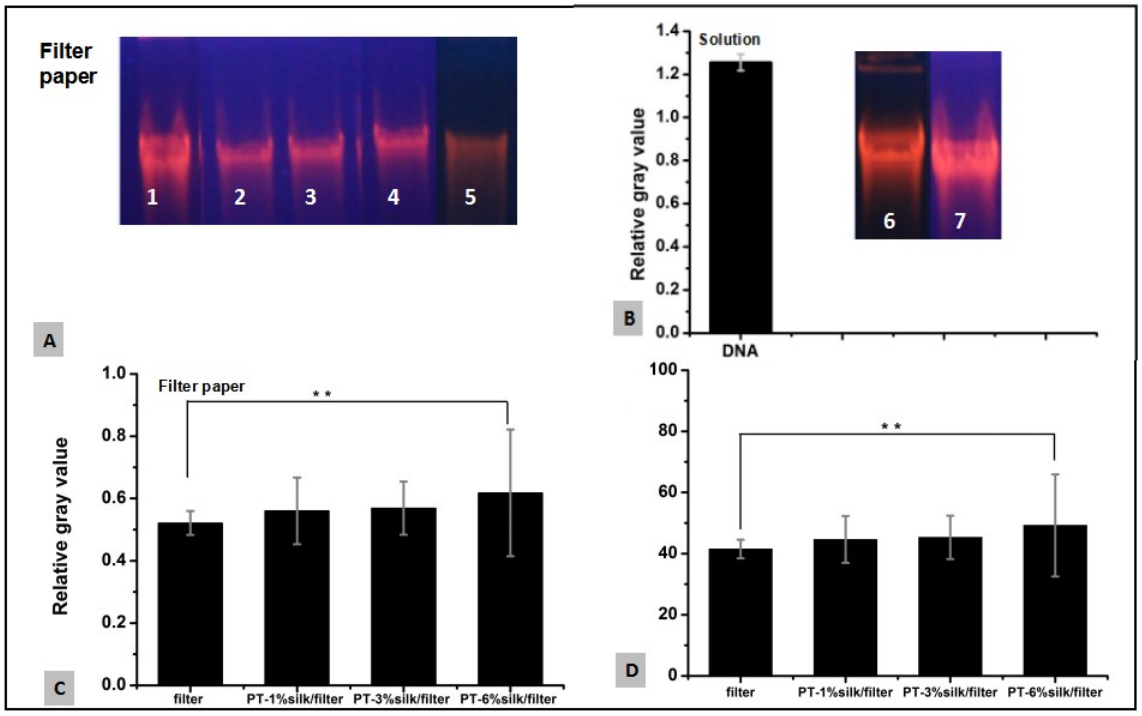

FIGURE S2. DNA extraction from the pre-treated filter paper with DNA deposited directly. A: Gel electrophoresis on DNA samples. Lanes 1, 6: control DNA (96 ng/µL) stored at -80 °C; lanes 2: DNA+filter; lanes 3: DNA+1%silk-PT-filter; lanes 4: DNA+3%silk-PT-filter; Lanes 5: DNA+6%silk-PT-filter; Lanes 2, 3, 4, 5: DNA

extracted from the filter papers; Lanes 7: DNA solution loaded directly to the gel. B: Relative gray values of the DNA solution samples. C: Relative gray value of DNA extracted from the filter papers (upper panel in A). D: Extraction recovery of DNA from the filter papers. N = 4. **indicates significant difference ($p < 0.005$) between groups.