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

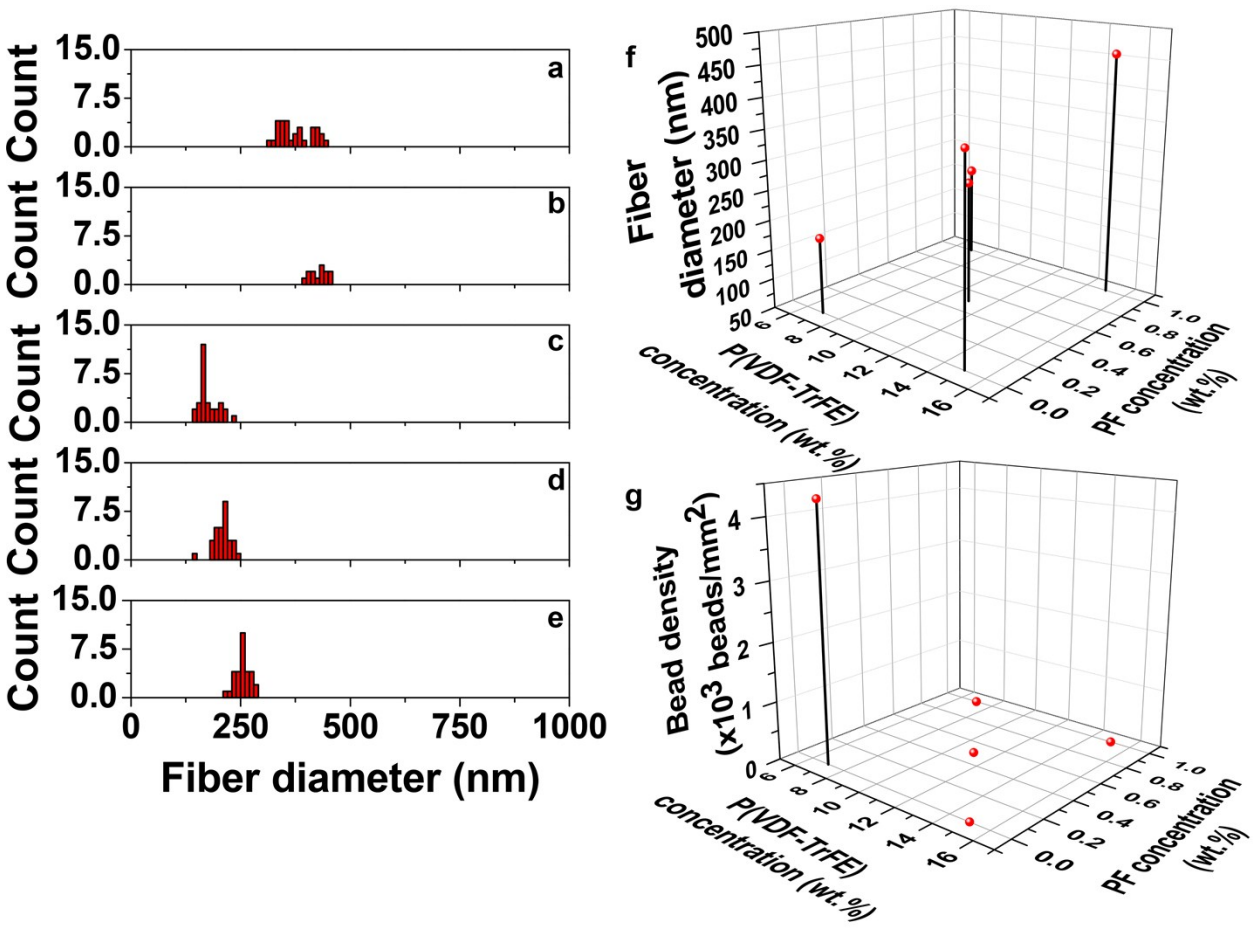

Figure S1. Fiber diameter and bead density with respect to design parameters. Resulting fiber diameter distribution of DOE1: 15 wt.% P(VDF-TrFE) solution with 0 wt.% (a) and 1 wt.% (b) PF, 7 wt.% P(VDF-TrFE) solution with 0 wt.% (c) and 1 wt.% (d) PF, and midpoint 11 wt.% P(VDF-TrFE) solution with 0.5 wt.% PF(e). Fiber diameter (f) and bead density (g) vs design parameters, P(VDF-TrFE(concentration (15,11, and 7 wt.%) and PF concentration (0, 0.5, and 1 wt.%) (n=30).

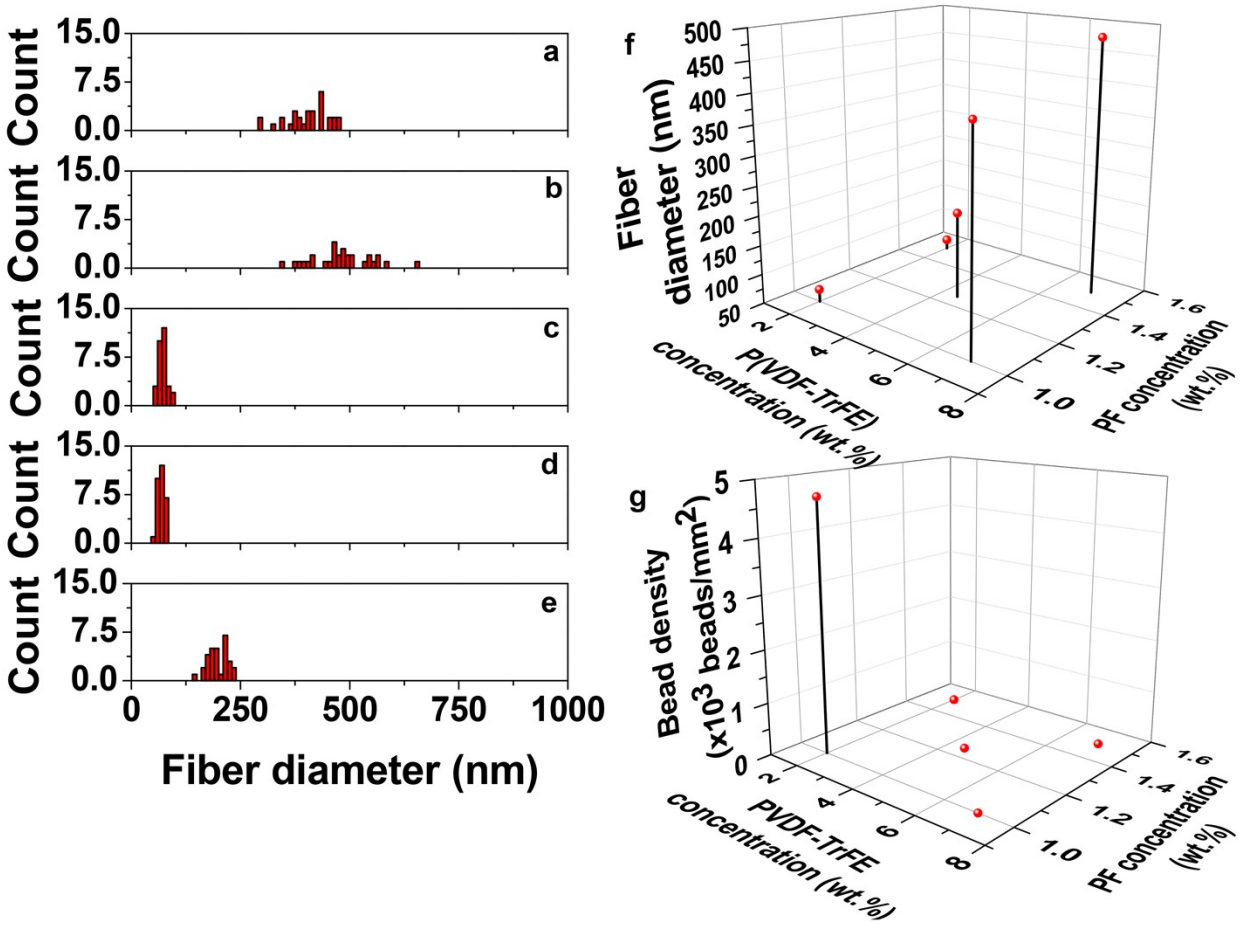

Figure S2. Fiber diameter and bead density with respect to design parameters. Resulting fiber diameter distribution of DOE2: 7 wt.% P(VDF-TrFE) solution with 1 wt.% (a) and 1.5 wt.% (b) PF, 2 wt.% P(VDF-TrFE) solution with 1 wt.% (c) and 1.5 wt.% (d) PF, and midpoint 4.5 wt.% P(VDF-TrFE) solution with 1.25 wt.% PF (e). Fiber diameter (a) and bead density (b) vs design parameters, P(VDF-TrFE) concentration (7, 4.5, and 2 wt.%) and PF concentration (1, 1.25, and 1.5 wt.%) (n=30).

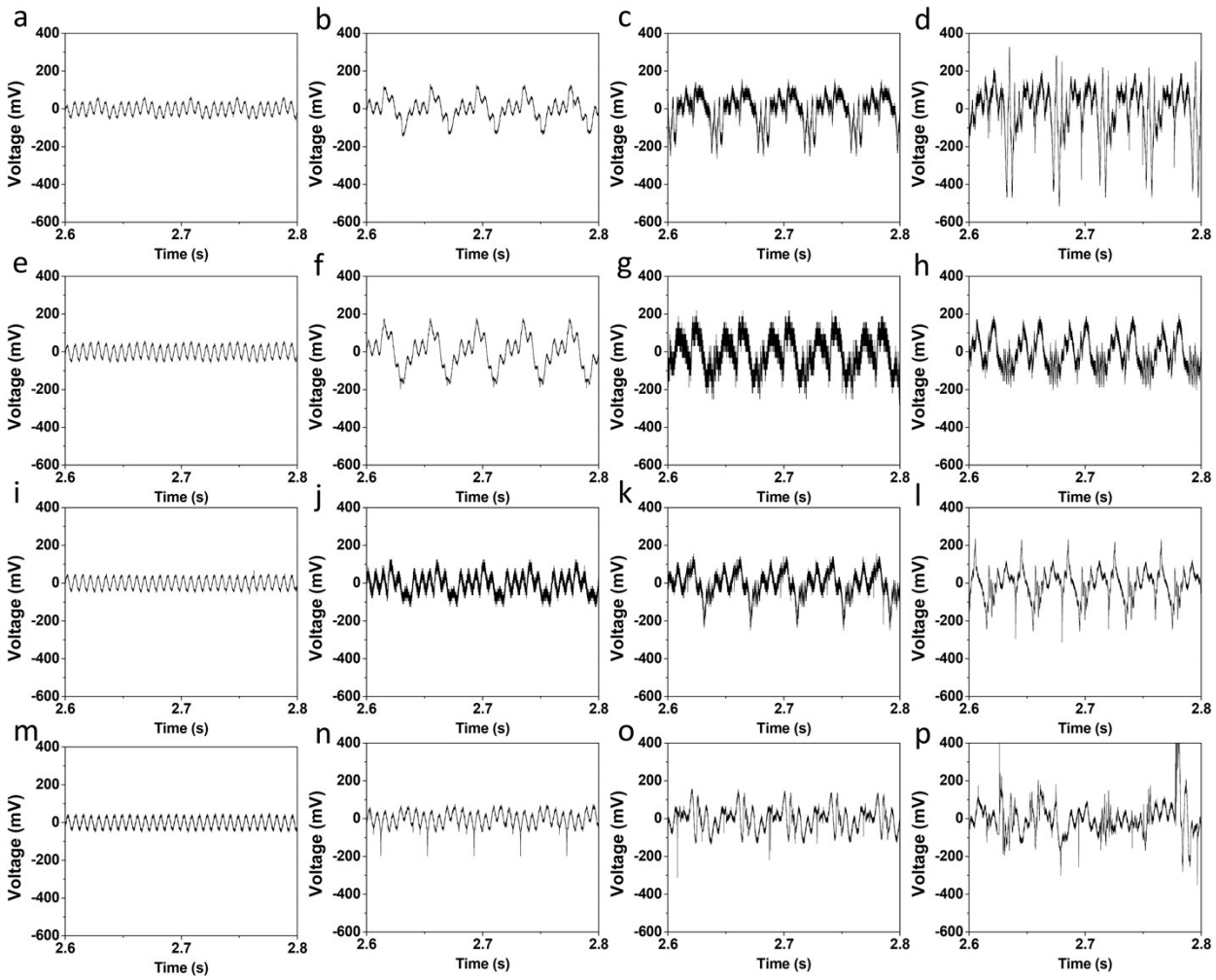

Figure S3. Representative voltage generation from electrospun P(VDF-TrFE) nanofiber mats having various average fiber diameters. Voltage output of the mats composed of average fiber diameters of 90 (a-d), 166 (e-h), 242 (i-l), and 859 nm (m-p) by surface strain of 0.03% (a,e,i,m), to 0.06% (b,f,j,n), to 0.13% (c,g,k,o), to 0.18% (d,h,l,p) at 10 Hz.

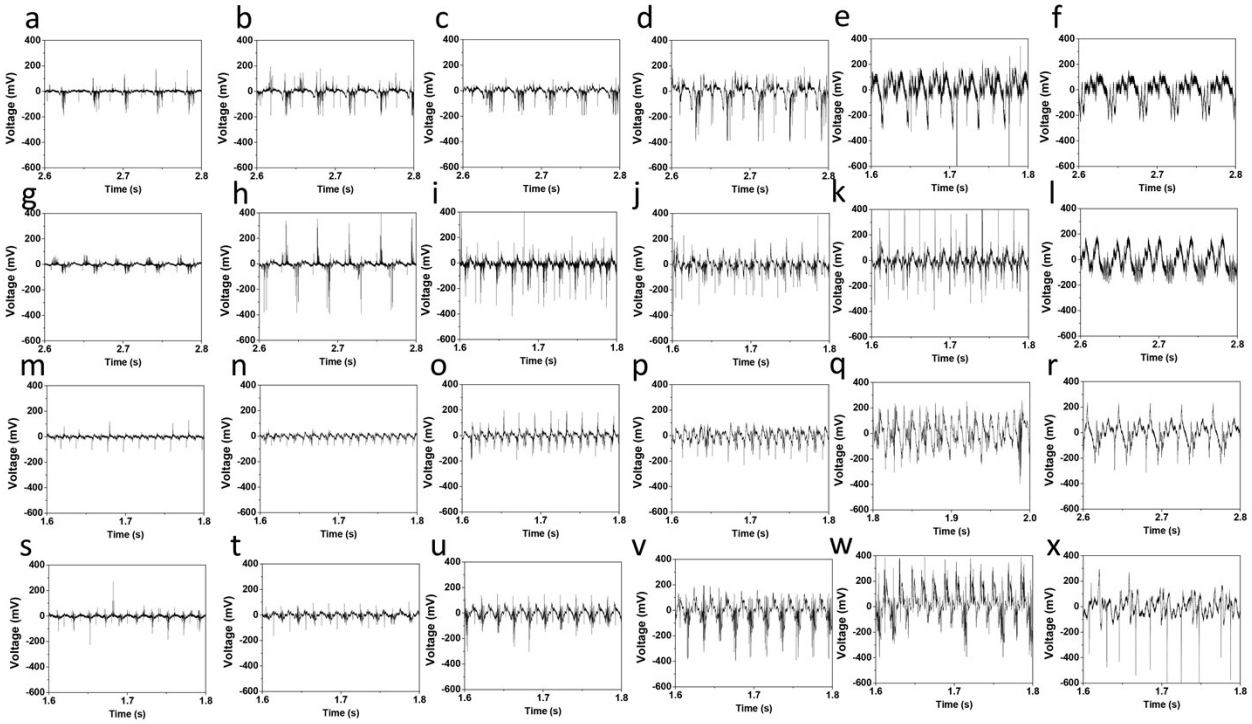

Figure S4. Representative voltage generation from electrospun P(VDF-TrFE) nanofiber mats having various average fiber diameters across varied total resistances. Voltage output of the mats composed of average fiber diameters of 90 (a-f), 166 (g-l), 242 (m-r), and 859 nm (s-x) under different total circuit resistances of 0.48 (a,g,m,s), 0.91 (b,h,n,t), 1.67 (c,i,o,u), 3.33 (d,j,p,v), 6.88 (e,k,q,w), and 10 MΩ (f,l,r,x). 0.18% of strain was applied at 10 Hz.

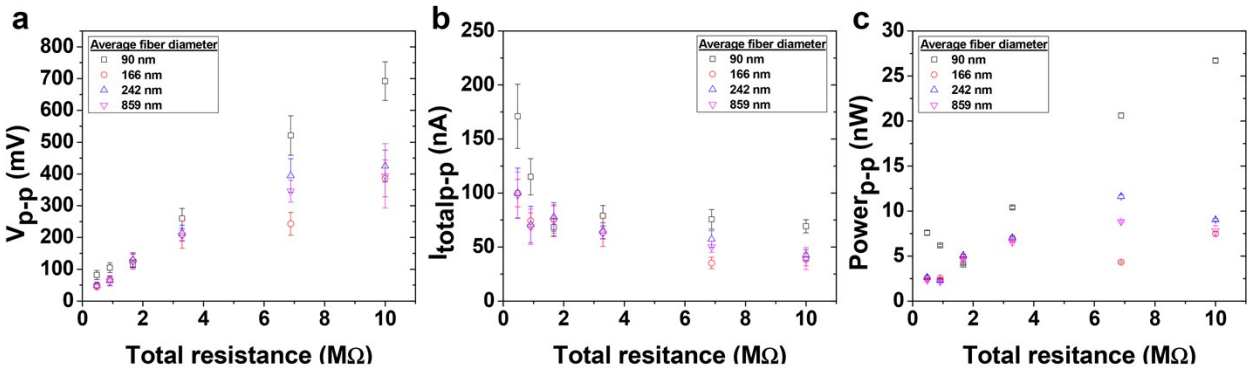

Figure S5. (a) Peak-to-peak voltage, (b) total peak-to-peak total current, and (c) peak-to-peak power of electrospun P(VDF-TrFE) nanofiber mats having various average fiber diameters. 0.18% of strain was applied at 10 Hz.

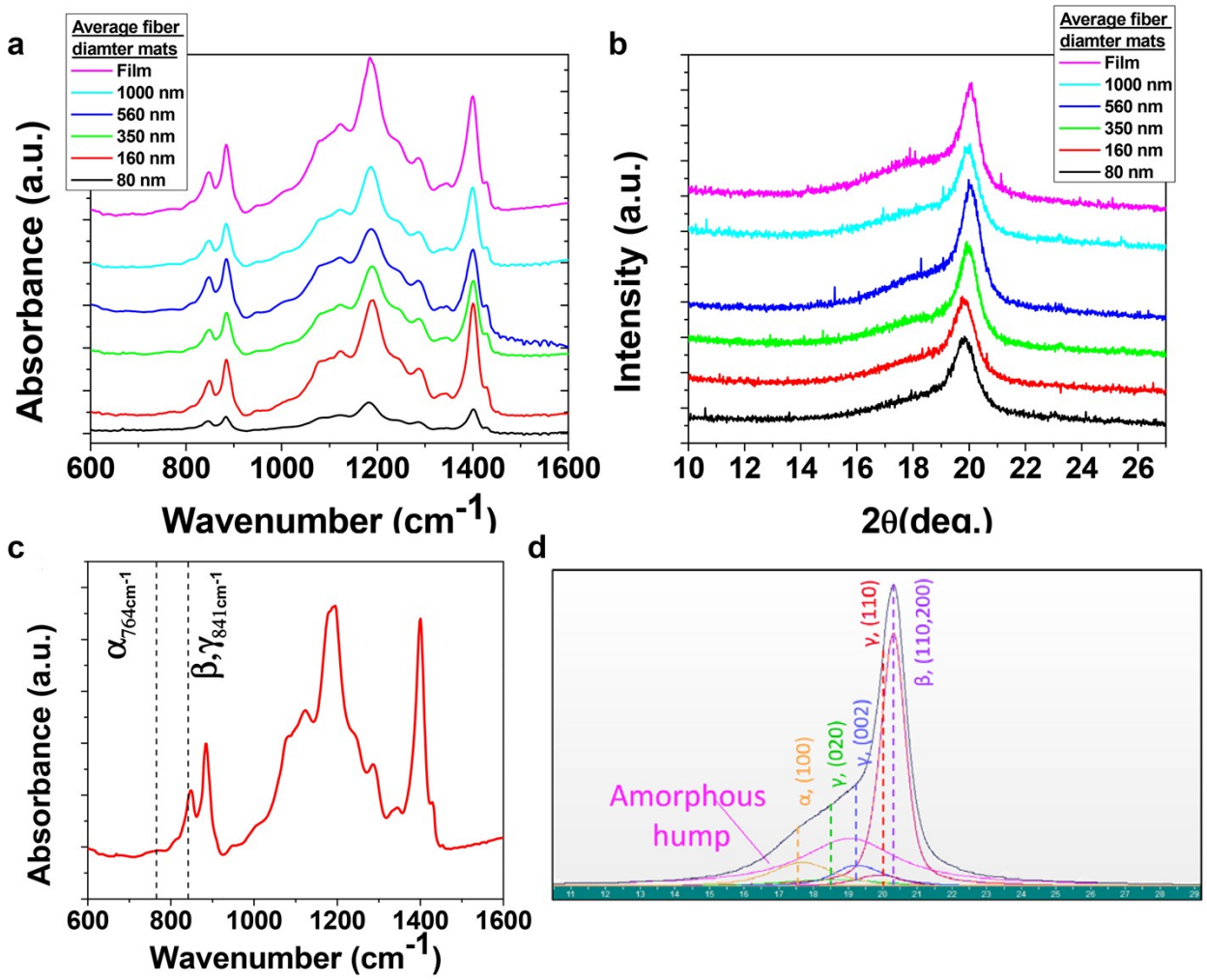

Figure S6. FTIR and XRD spectra analysis of electrospun P(VDF-TrFE) nanofibers having various fiber diameters. Representative (a) FTIR and (b) XRD spectra of electrospun P(VDF-TrFE) fibers having different average fiber diameters. Representative spectra of drop casted P(VDF-TrFE) thin film are also shown. (c) A representative FTIR spectrum with peak assignment for the α- and electroactive phases at 764 and 841 cm^{-1}, respectively. (d) An example of peak deconvolution of a representative XRD spectrum.