Electronic Supplementary Information
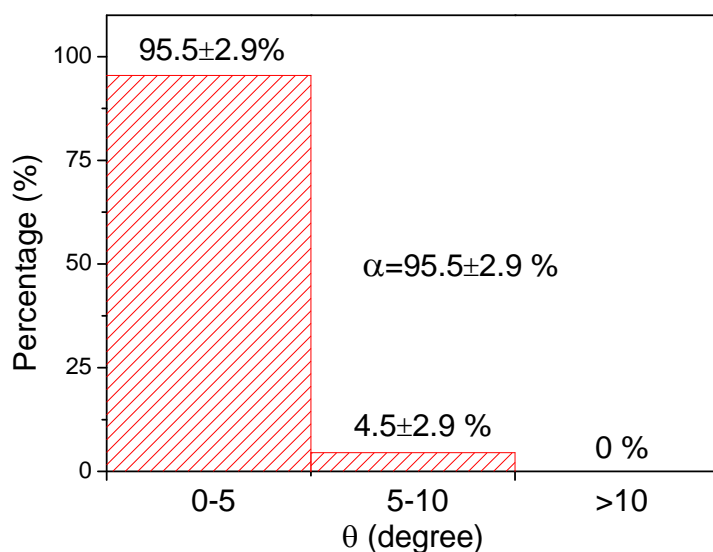

Fig. S1 Distributions of the degree of alignment (θ) defined by the difference between the angles of orientation (ϕ) of fibers and the long axis. Experimental parameters are: PS concentration 18%, voltage 2.8 kV, rotating speed 390 rpm, work distance 5 cm, work radius 16 cm, and DS time 4 min. The angles were measured on an Image-Pro Plus instrument.
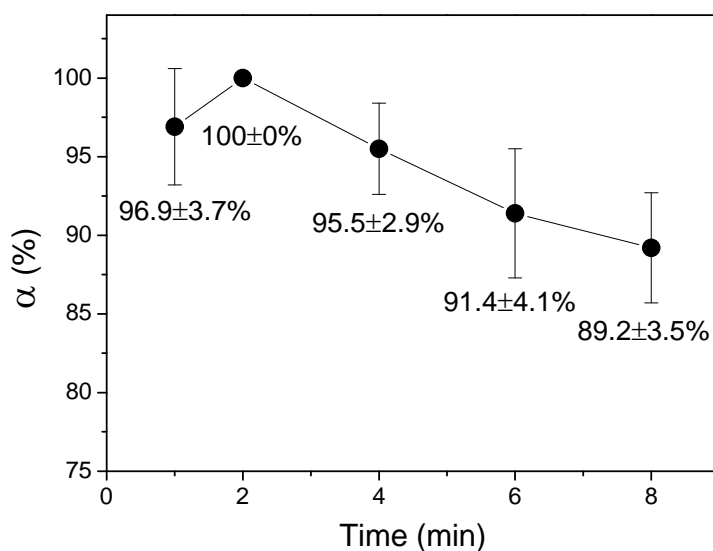

Fig. S2 Spinning time versus α (the percentage of fibers with $\theta < 5^{o}$). The angles were measured on an Image-Pro Plus instrument.
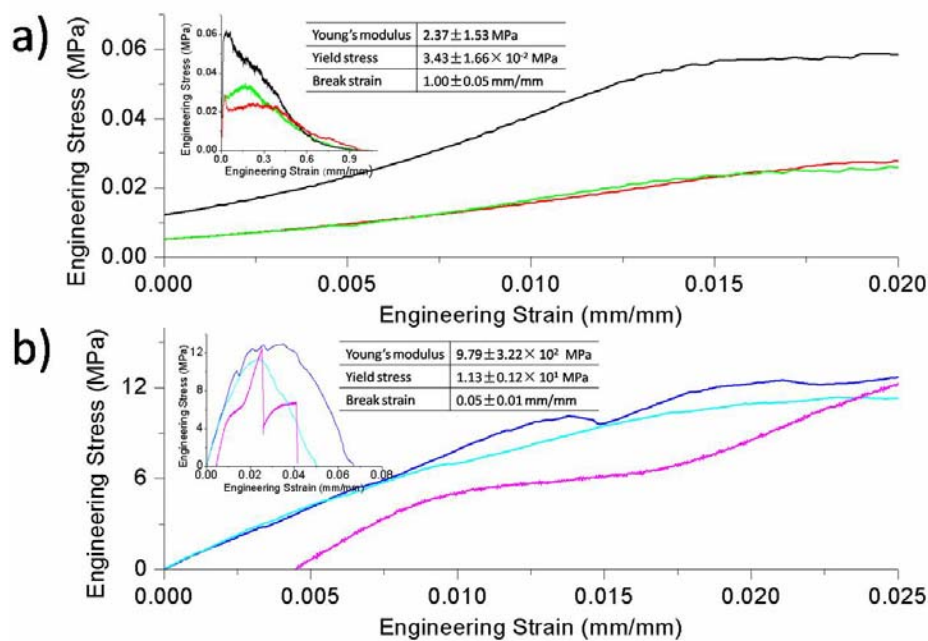
Fig. S3 Stress-Strain curves of DS nonwoven mats (a, three specimens) and aligned fibrous arrays (b, three specimens). The inset figures show the entire data. The deformation speeds are 1 and 0.2 μm/s for nonwoven mats and aligned fibrous arrays, respectively. The measurements were carried out by the Agilent T150 UTM.
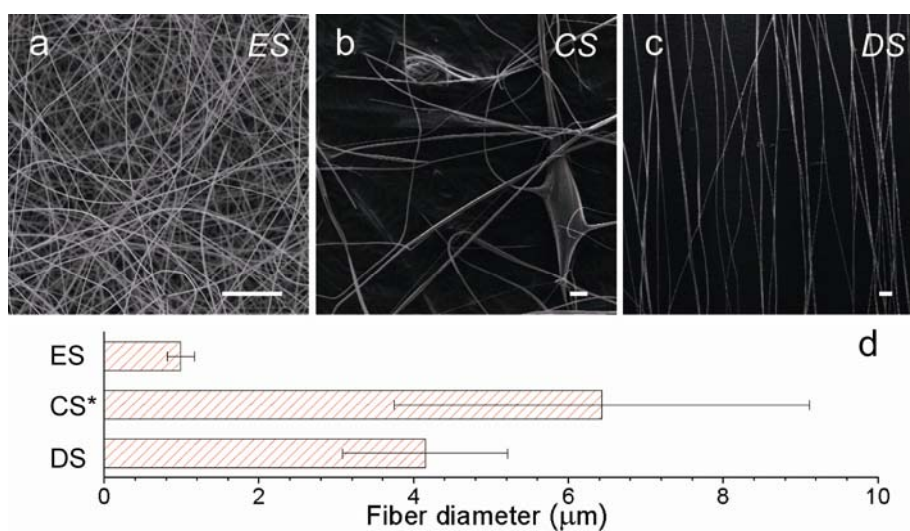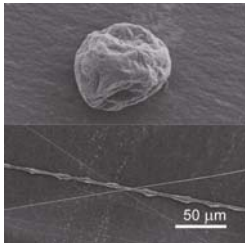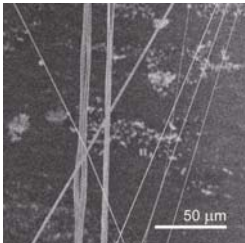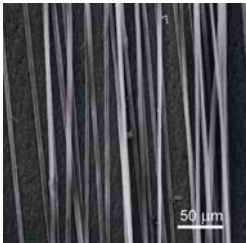

Fig. S4 SEM images of as-spun PMMA fibers fabricated by a) ES, b) CS, and c) DS. Scale bars are 50 μm. d) The average diameters of the fibers spun by three methods. *Do not include the size of the bead structures among CS fibers.

Table S1 Influence of the polymer concentration on the morphologies of the DS fibers.

PS concentration	6%	12%	18%	24%
Result	Microspheres and beaded fibers	Non-uniform fibers	Aligned uniform fibers	Spinning failed
Morphology				

Note: Other parameters are the same: voltage 2.8 kV, rotating speed 360-390 rpm, work distance 5 cm, work radius 16 cm.

Table S2 DS PVP fibers fabricated with different solvents.

Solvent	Ethanol	H$_2$O
Result	Aligned fibrous arrays	No fibers formed

Note: Other parameters are the same: PVP concentration 10%, voltage 5 kV, rotating speed 360 rpm, work distance 5 cm, work radius 16 cm.