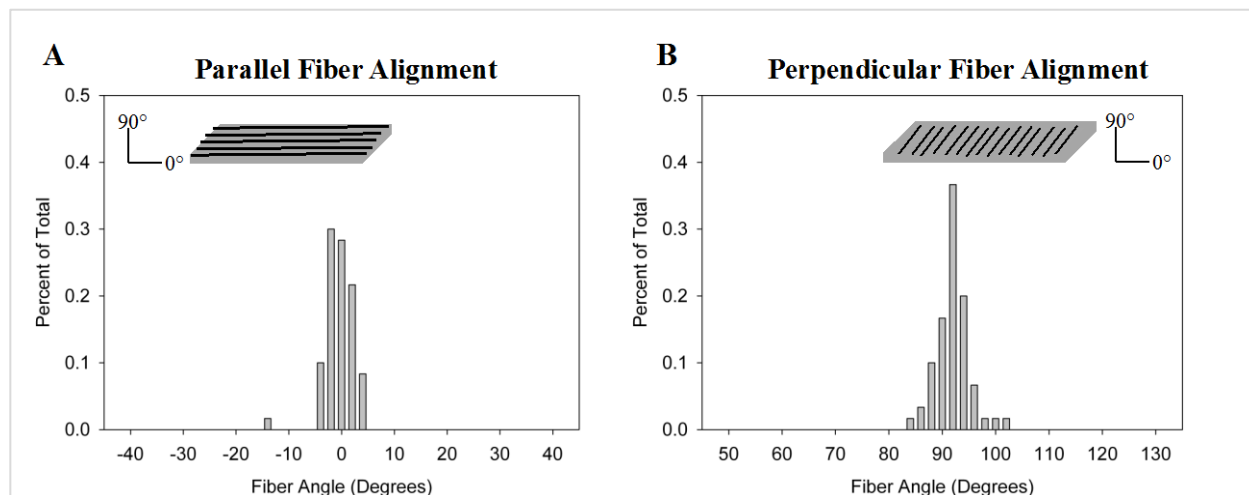
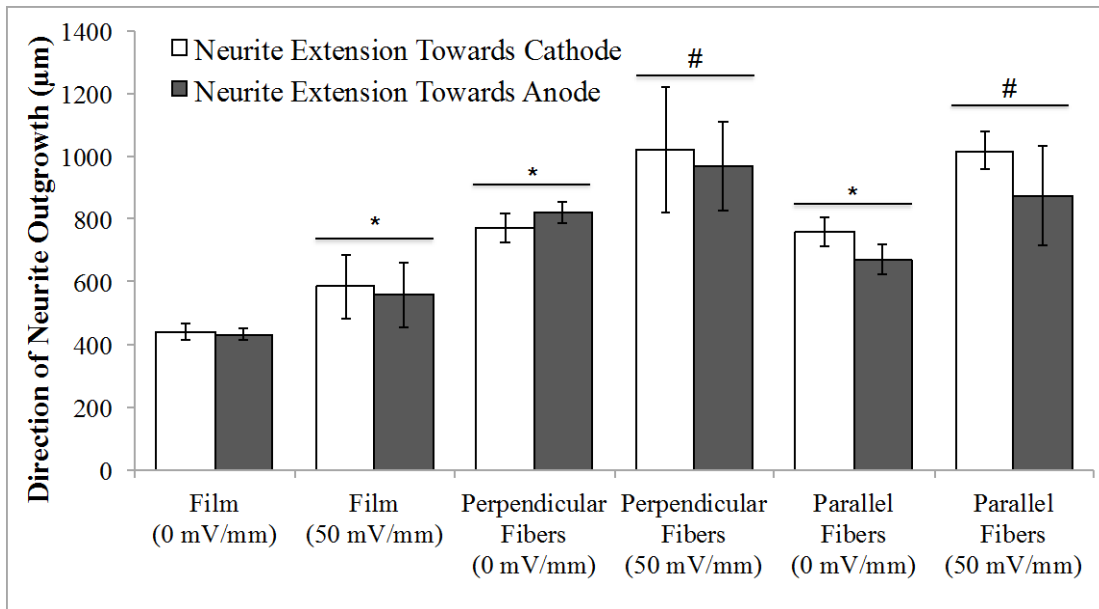


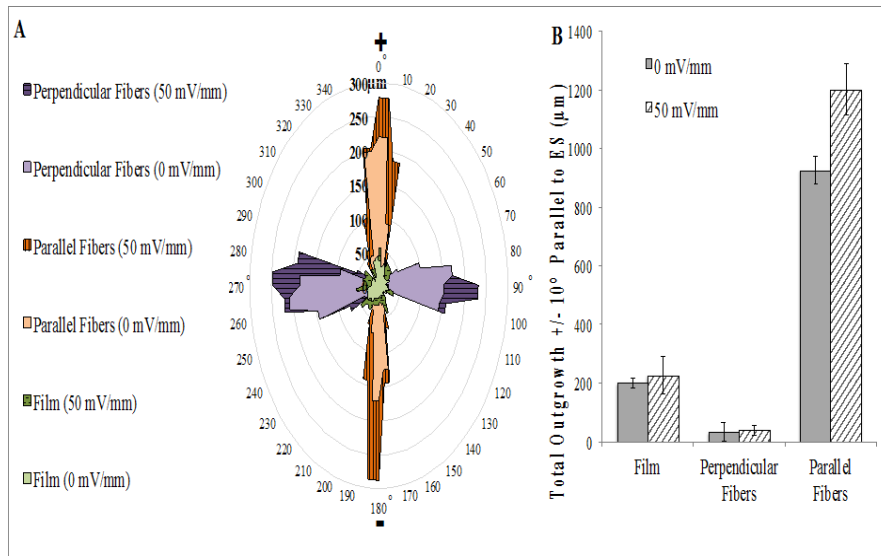
## 1.7 Supplemental Figures



**Supplemental Figure 1.** Electrospun fibers deposited (A) parallel or (B) perpendicular to the long axis of the cover glass are highly aligned with greater than 95% of fibers  $\pm 10^\circ$ .  $0^\circ$  represents the parallel reference line and 90 represents the perpendicular reference line to the long axis of the glass coverslip. n=3.



**Supplemental Figure 2.** No directional bias towards the anode or cathode is induced by electrical stimulation. Paired controls for each growth substrate (film vs. fiber) and electrical stimulation (0 mV/mm vs. 50 mV/mm) were examined for outgrowth towards the cathode or anode and no significant differences were observed. Directionality of outgrowth was calculated in 45° quadrants centered at 0° 180° for parallel fibers, and 90° and 270° for perpendicular fibers. No significant differences were observed in outgrowth between anodal or cathodal orientation for each condition. \*= p<0.05 to flat films; #= p<0.05 to flat film and respective controls. n=3, standard deviation shown.



**Supplemental Figure 3.** Aligned topographical cues are dominant over directionality of an applied electrical stimulus. Polar histogram of directional neurite outgrowth. Neurons grown on films (N + Film, green) exhibit non-directional outgrowth that is further enhanced by electrical stimulation (N + Film + ES, green-dash). Neurons grown on PLLA fibers oriented parallel (N + Parallel, orange), or perpendicular (N + Perpendicular, light purple) exhibit directional outgrowth on the highly aligned fibers that is enhanced from neurons on PLLA films. The combination of both electrical stimulation with topographical cues for either parallel (N + Parallel + ES, purple-stripe), or perpendicular (N + Perpendicular + ES, orange stripe) results in a further increase in neurite outgrowth along the axis of the fiber direction. Direction of the electrical stimulus is shown (+/-), which is parallel to the stimulus. n=3.