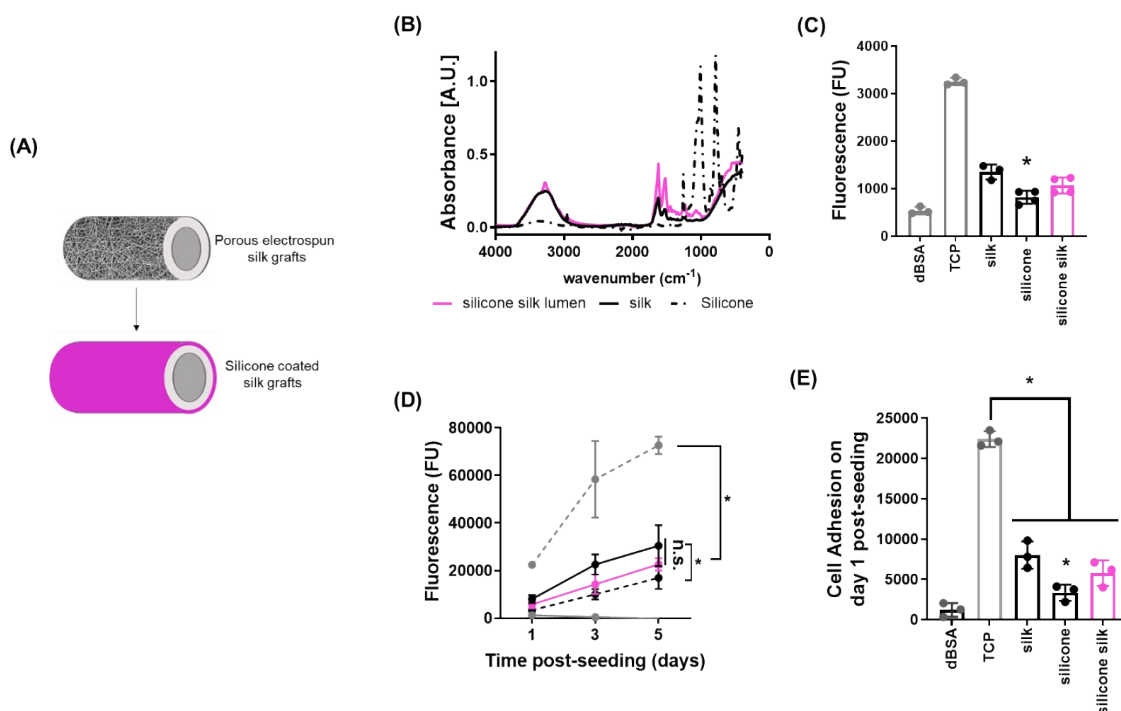
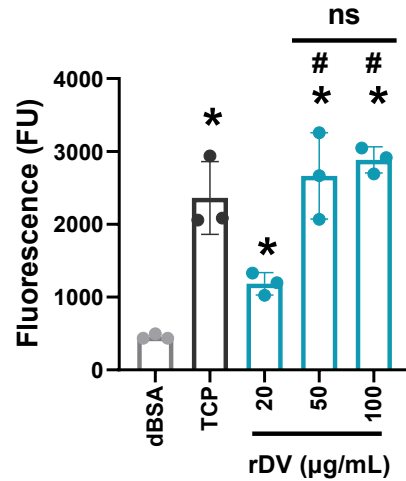


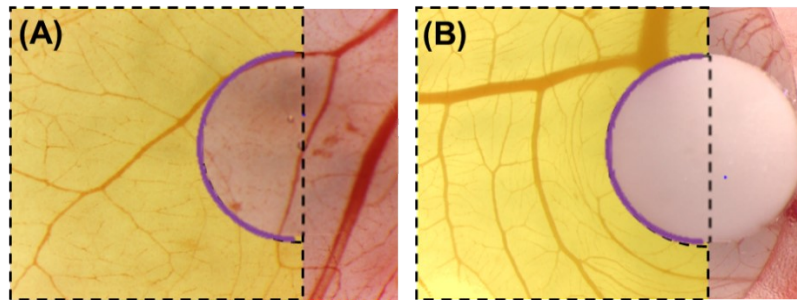
Supplementary Information



S1 Presence of silicone has reduced HUVEC adhesion on electrospun silk biomaterial but did not affect cell proliferation. (A) To prevent leakage, a silicone mix (pink) was applied to the outer surface of the electrospun silk tubes and cured. (B) Electrospun silk scaffolds, silicone mix, and the luminal region of the silicone-coated silk scaffolds ($n = 3$) were probed with ATR-FTIR to obtain the absorption spectra in the infrared region. (C) HUVECs were seeded on silk scaffolds with or without the silicone outer layer, silicone alone, and compared to negative control (dBSA), and positive control (TCP). Cell adhesion on scaffolds was quantified by using the CYQUANT assay (mean $\pm$ standard deviation, $n=3$). (D) HUVECs were seeded onto silk with or without the silicone outer coating, standalone silicone, negative control (denatured BSA (dBSA)), or positive control (TCP), and relative cell number was measured (fluorescence intensity) using the Alamar blue cell metabolic assay on days 1, 3 and 5 post-seeding. (E) The rate of cell proliferation was calculated relative to the fluorescence at day 1 for each condition. Data are presented as mean $\pm$ standard deviation ($n=4$). * denotes $p < 0.05$ compared to positive control analysed by two-way ANOVA.



S2 rDV concentration optimization on electrospun silk scaffolds. HUVECs were seeded on dBSA (negative control), TCP (positive control) or electrospun silk scaffolds biofunctionalized with rDV (20–100 µg/mL) for 3 h. Cell adhesion was quantified using the CYQUANT assay and compared to the negative control and rDV at 20 µg/mL on TCP (mean ± standard deviation, n=3). * denotes $p < 0.05$ compared to TCP control analyzed by one-way ANOVA. # denotes $p < 0.05$ compared to rDV at 20 µg/mL.



S3 Analysis of CAM images with silk scaffolds and controls. All images were taken within the silicone ring. To allow consistency for images (A) without or (B) with a scaffold, the number of blood vessel branches in the highlighted region and the number of blood vessels intersecting the scaffold or the semi-circle for images without scaffolds (purple) were counted.