Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplemental Materials:

Supplemental Figure 1

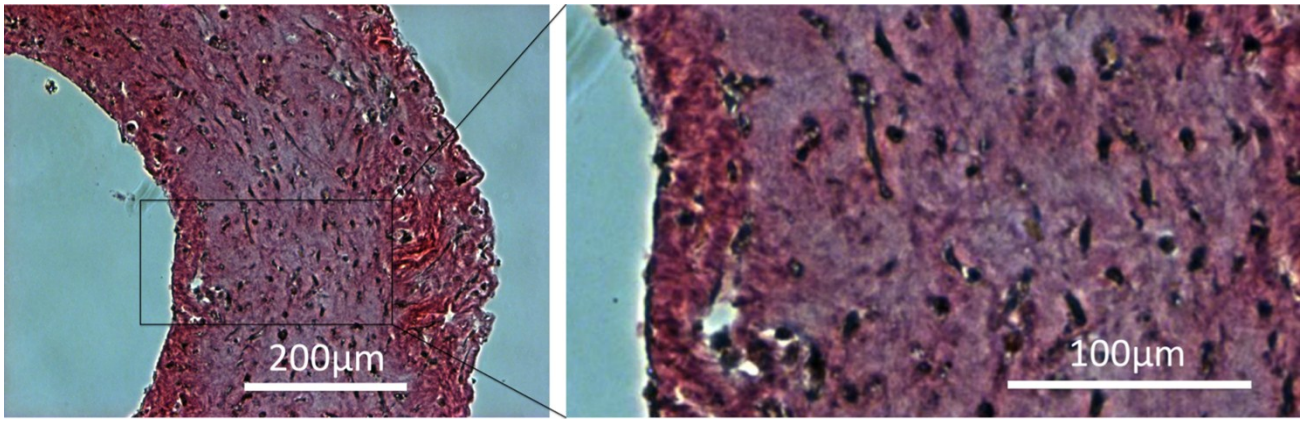


Figure Caption:

Image of TEBV with H&E staining. Left panel, the image of cross-sectioned TEBV with H&E staining (same as figure 2D). Right panel, an amplified image of a region indicated in the left panel. Image shows the smooth muscle cells distributed in the wall of TEBVs and endothelial cells on the lumen of TEBV. The thickness of each slide was 5um and the image was taken under microscopy in bright-field mode with 10x objective.

Supplemental Figure 2

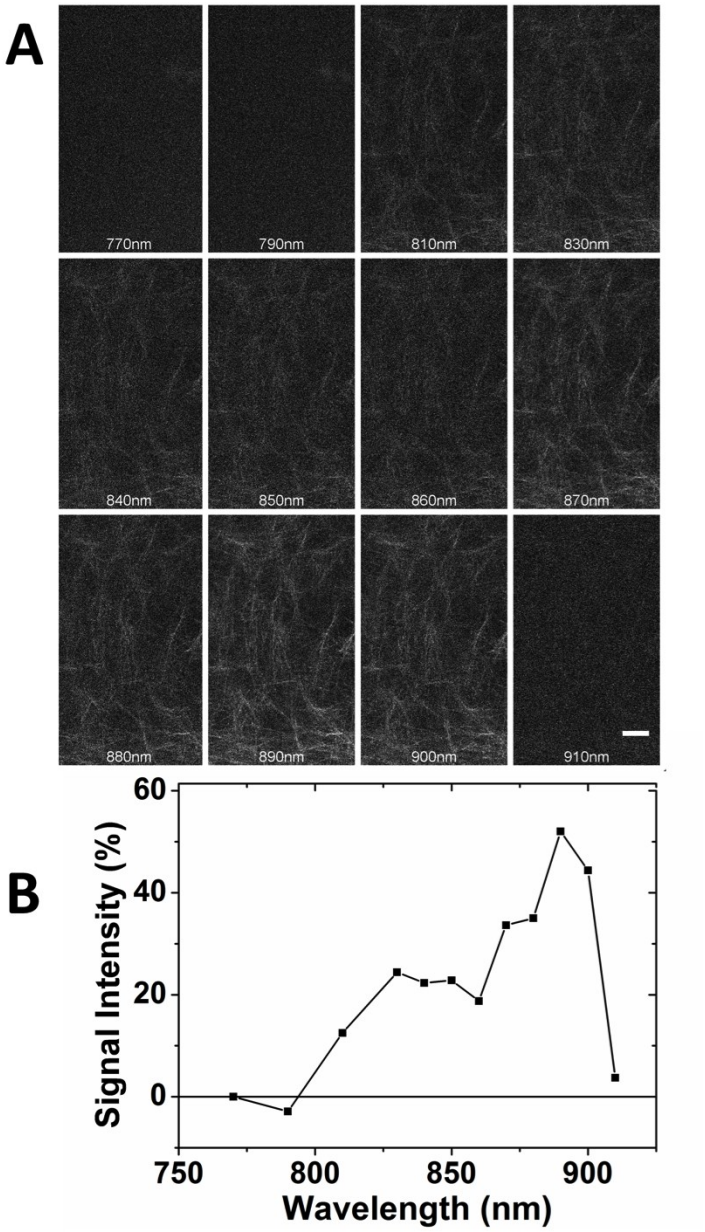


Figure Caption:

Imaging of collagen fibers using second harmonic imaging technique. Excitation wavelength was explored from 770nm to 910nm; the emission channel was set with a 400-450 nm bandpass filter. An excitation at 890nm was selected for final imaging.

Supplemental Figure 3

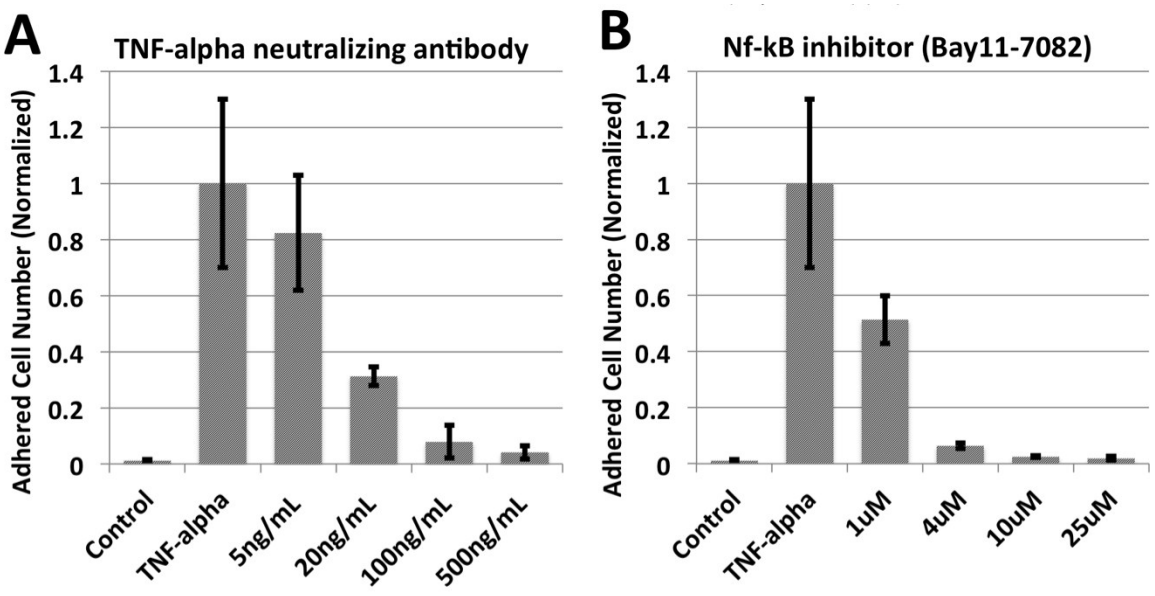
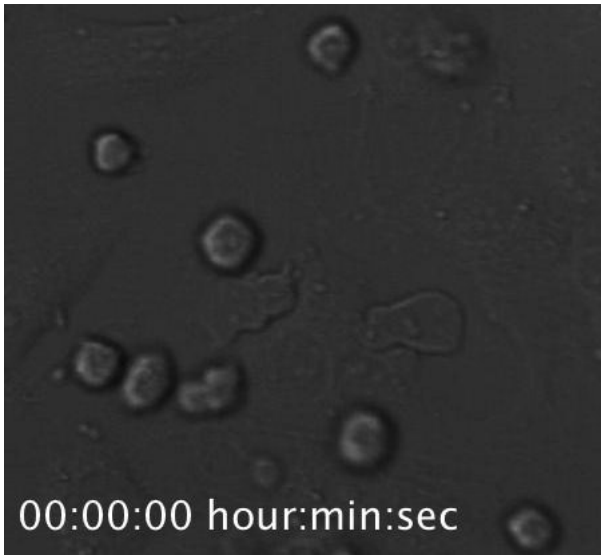


Figure Caption:

Drug efficacy tested in 2D cultured EPC. Quantification of cell attachment on 2D cultured EPC with TNF-α neutralizing antibody (5ng/ml, 10ng/ml, 20ng/ml, 100ng/ml and 500ng/ml) or (B) with an NF-kB inhibitor (Bay 117082) (1μM, 4 μM, 10μM, 25μM). Data were from 3 experiments. Significance was determined by one-way ANOVA and Tukey's post hoc test.

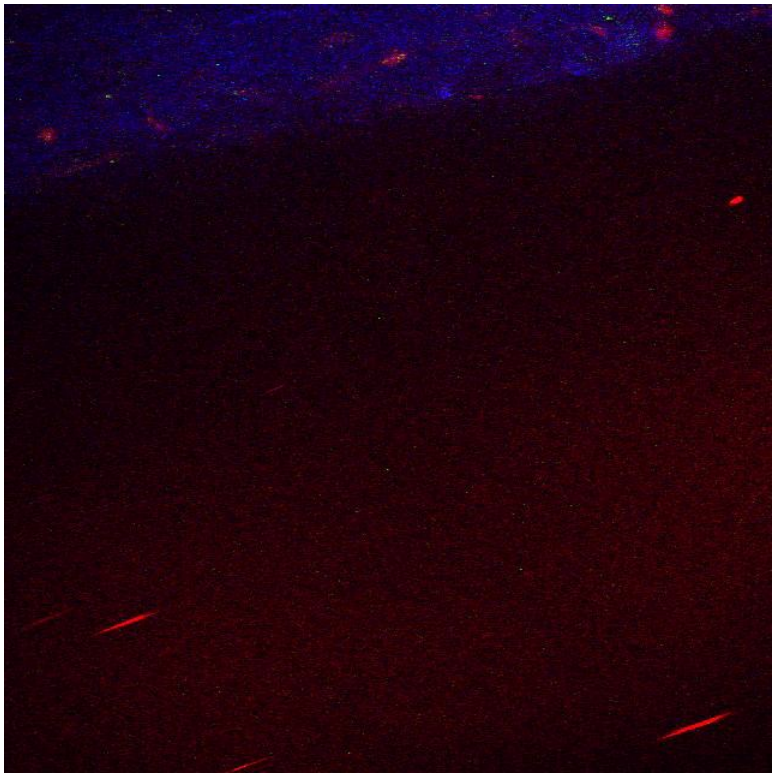
Supplemental Movie 1



Movie Caption:

Monocyte adherence and transmigration on 2D cultured endothelial cells. Time-lapse DIC microscopy recording of monocyte-like HL-60 cells adhered and transmigrated on 2D cultured EPC. EPCs were activated by 20ng/mL TNF-alpha for 4 hours before monocytes were added to the culture plate at 10^5 cells/mL. The movie demonstrates that monocytes adhered to the confluent endothelial layer and some of the monocytes migrated to the bottom of the EC layer and became flat. The movie was recorded at 10 s intervals and played back at 6 frames per second (fps).

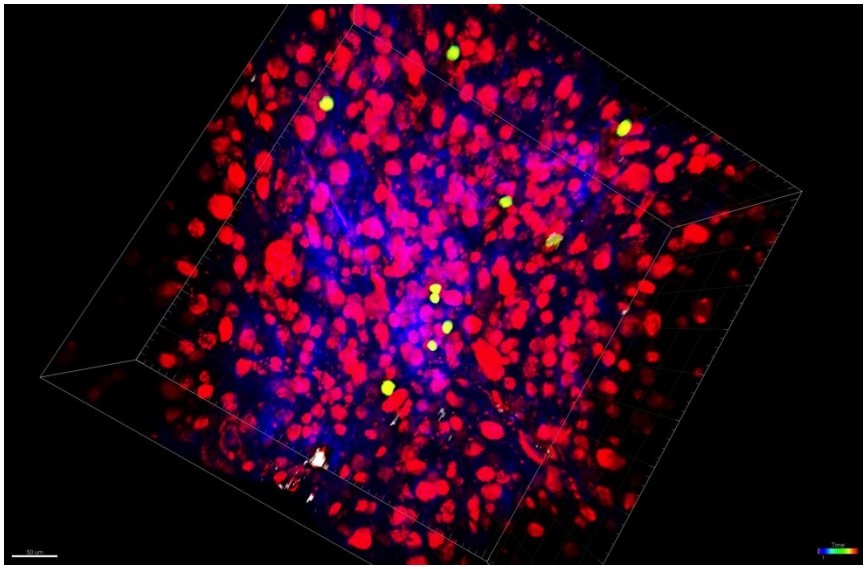
Supplemental Movie 2



Movie Caption:

Monocyte perfusion and adherence onto TEBV lumen. Two-photon fluorescent confocal microscopy recording of monocyte-like HL-60 cell adherence and transmigration in TEBV. TEBV endothelium was activated 20ng/mL of TNF-α for 4 hours before monocytes were perfused in PIC at 10^4 cells/mL. Movie recorded a monocyte adhering to endothelium, its transmigration (yellow arrow), and a new monocyte attachment event (green arrow). The movie was recorded with 25x L.W.D. objective at 1fps and played back at 4 fps.

Supplemental Movie 3



Movie Caption:

Monocyte adherence and transmigration on TEBV lumen. Two-photon fluorescent confocal microscopy recording of monocyte-like HL-60 cell adherence and transmigration in TEBV. TEBV endothelium was activated by 20ng/mL of TNF-α for 4 hours before monocytes were perfused in the TEBV at 10^4 cells/mL. Movie recorded multiple monocytes adhering to the endothelium and their transmigration into the TEBV wall. The movie was reconstructed from image stacks at 1 frame per minute and played back at 1 fps.