Self-assembled Human Arteriole-on-a-Chip for Arterial Functionality Testing and Disease Modeling

Supplementary information

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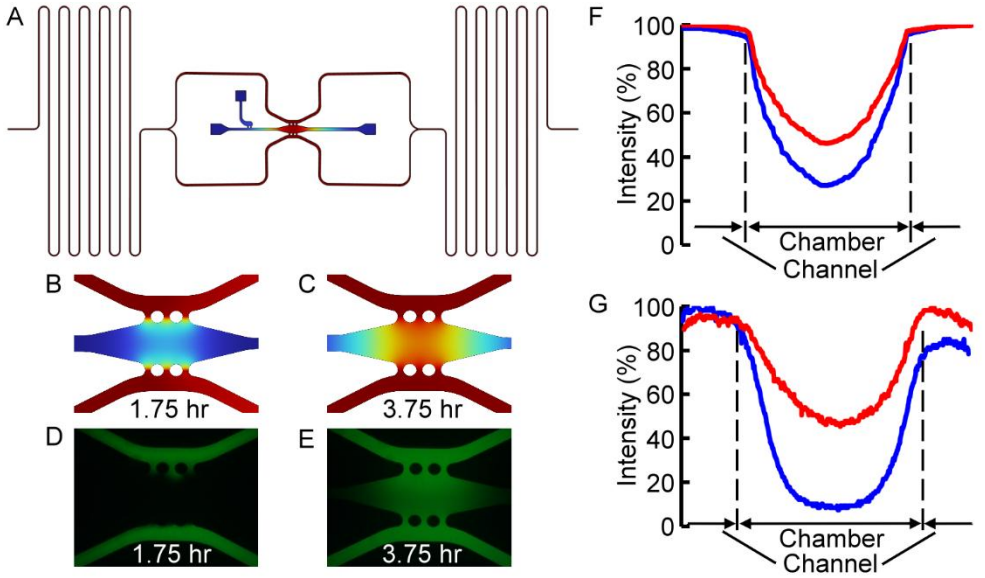

Fig. S1 Simulated pressure distribution of the static culture condition for stimulating vasculogenesis and angiogenesis (A), and simulated and fluorescent micrographs of the diffusion patterns of FITC labeled 70 kDa dextran at 1.75 hours (B, D) and 3.75 hours (C, E). Diffusion profiles across the arteriole chamber: simulated (F) and fluorescent micrographs (G) at 1.75 hours (blue lines) and 3.75 hours (red lines).

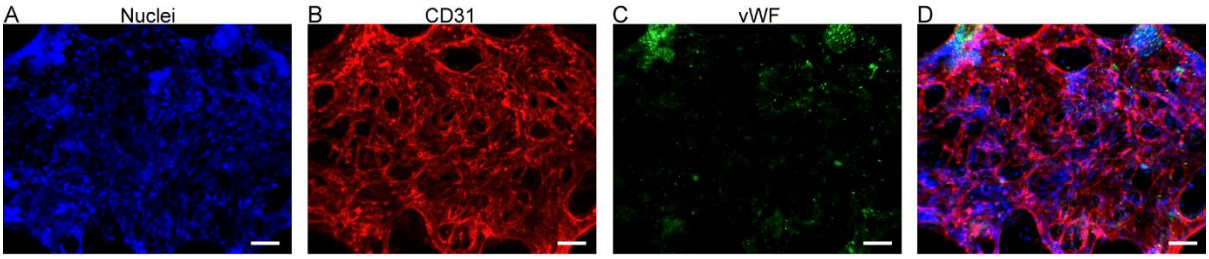

Fig. S2 Fluorescent images of the control group in the arterial thrombosis experiment. HUAEC vessels were not treated with PMA to induce vWF secretion. Nuclei (A), CD31-labeled vessels (B), and vWF (C) are shown in blue, red, and green, respectively. The merged image is shown in (D). (Scale bar = 100 µm)

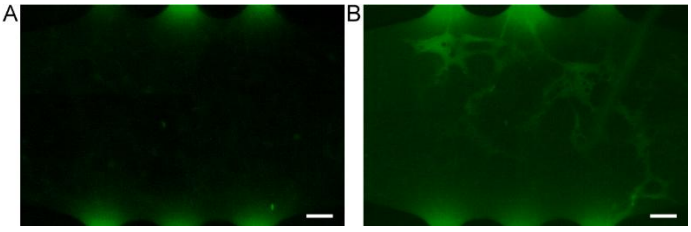

Fig. S3 Fluorescent micrographs of a HUAEC vessel network showing an imperfusable state on Day 7 (A) and successful perfusion following low shear stress application on Day 8 (B). (Scale bar = 100 µm)

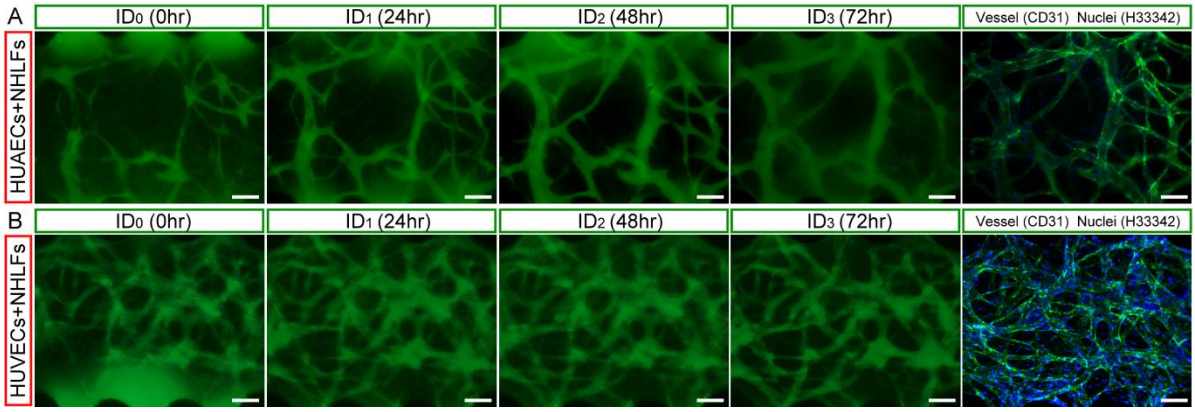

Fig. S4 Fluorescent micrographs of vessel networks developed from HUAECs + NHLFs coculture (A) and HUVECs + NHLFs coculture (B). These vessels were cultured under a high shear stress condition for 72 hours (ID_0 to ID_3). The final vessel structures and nuclei were stained with CD31 (green) and H33342 (blue). (Scale bar = 100 µm)

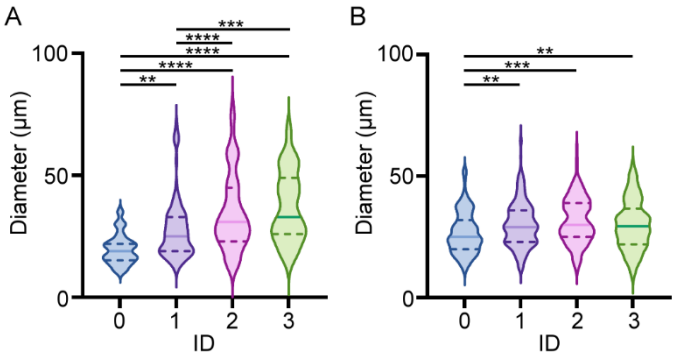

Fig. S5 Statistical analysis of vessel diameters under high shear stress conditions for HUAEC+NHLF co-cultures (A) and HUVEC+NHLF co-cultures (B).