



**Fig. S2** Media-wave profiles across cross-sections of pulsatile-flow culture channels using different mixer speeds and viscosities. (A) Media heights across the channel, showing minimal variability between high-viscosity and low-viscosity media. (B) Media-surface speeds were observed to be nearly double at each point for high-viscosity media compared to low-viscosity media. (C) Translated bed shear stresses derived from surface speeds from channel cross-sections. Shear stresses exhibited the greatest variations at higher speeds, particularly in the high-viscosity media.