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

Supporting Information

Centrifugation-free separation of platelets by size in a microfluidic device based on controlled incremental filtration

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Figure S1

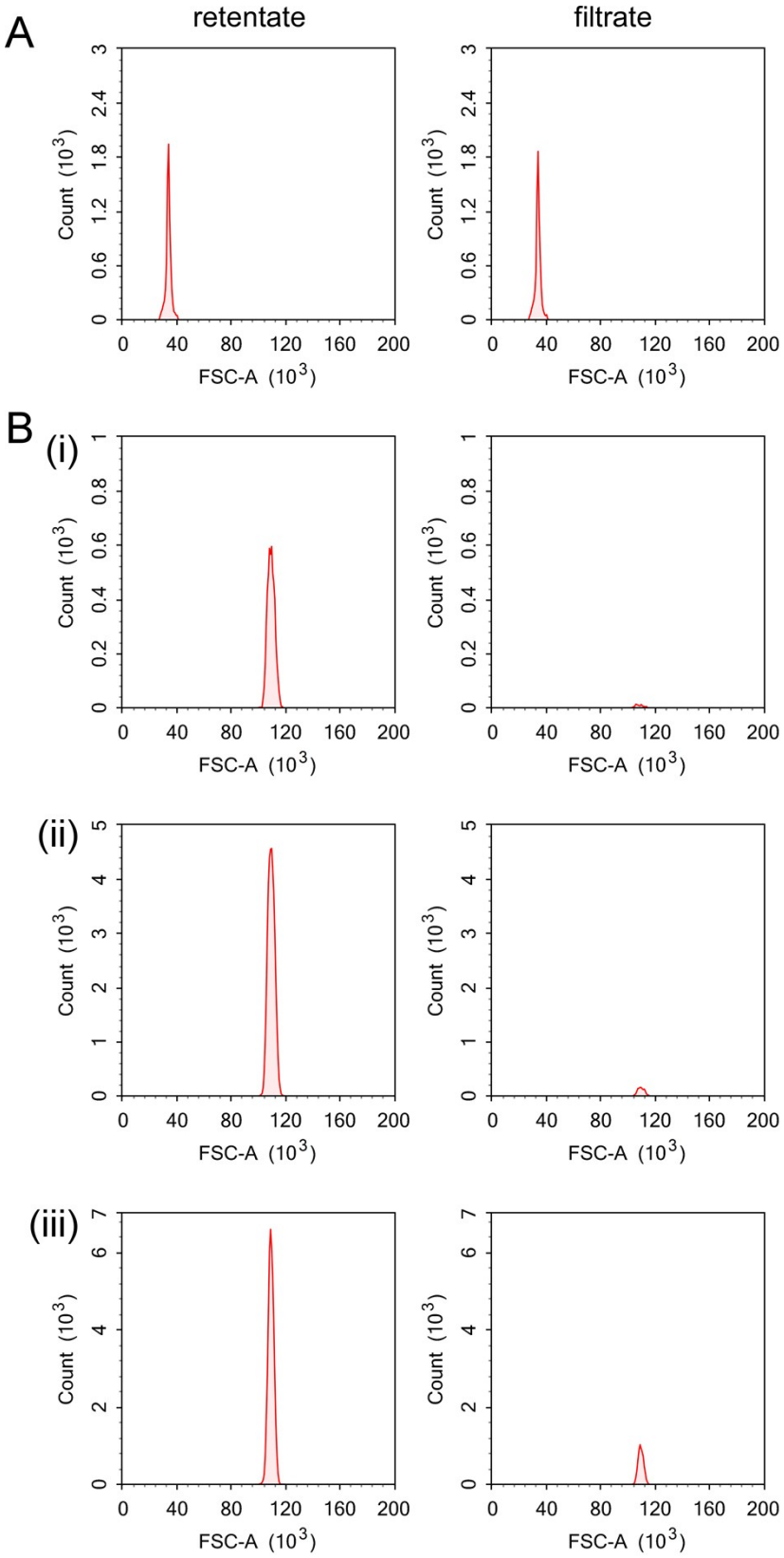

Figure S1 Typical distribution of spherical beads between the retentate (left) and filtrate (right) for a CIF device (f_{gap}^{*} = 1.04×10^{-4}) operating at a flow rate of 30 μL/min. (**A**) For small beads with nominal average diameter of 1 μm and concentration of 213 beads/μL fluid volume recovery in filtrate was 52% and bead recovery in filtrate was 54%. (**B**) For large beads with nominal average diameter of 4.7 μm recovery in filtrate depended on bead concentration. (**i**) Concentration: 106 beads/μL, fluid volume recovery in filtrate: 50%, bead recovery in filtrate: 1.8%. (**ii**) Concentration: 799 beads/μL, fluid volume recovery in filtrate: 52%, bead recovery in filtrate: 3.5%. (**iii**) Concentration: 1714 beads/μL, fluid volume recovery in filtrate: 48%, bead recovery in filtrate: 6.8%.

Figure S2

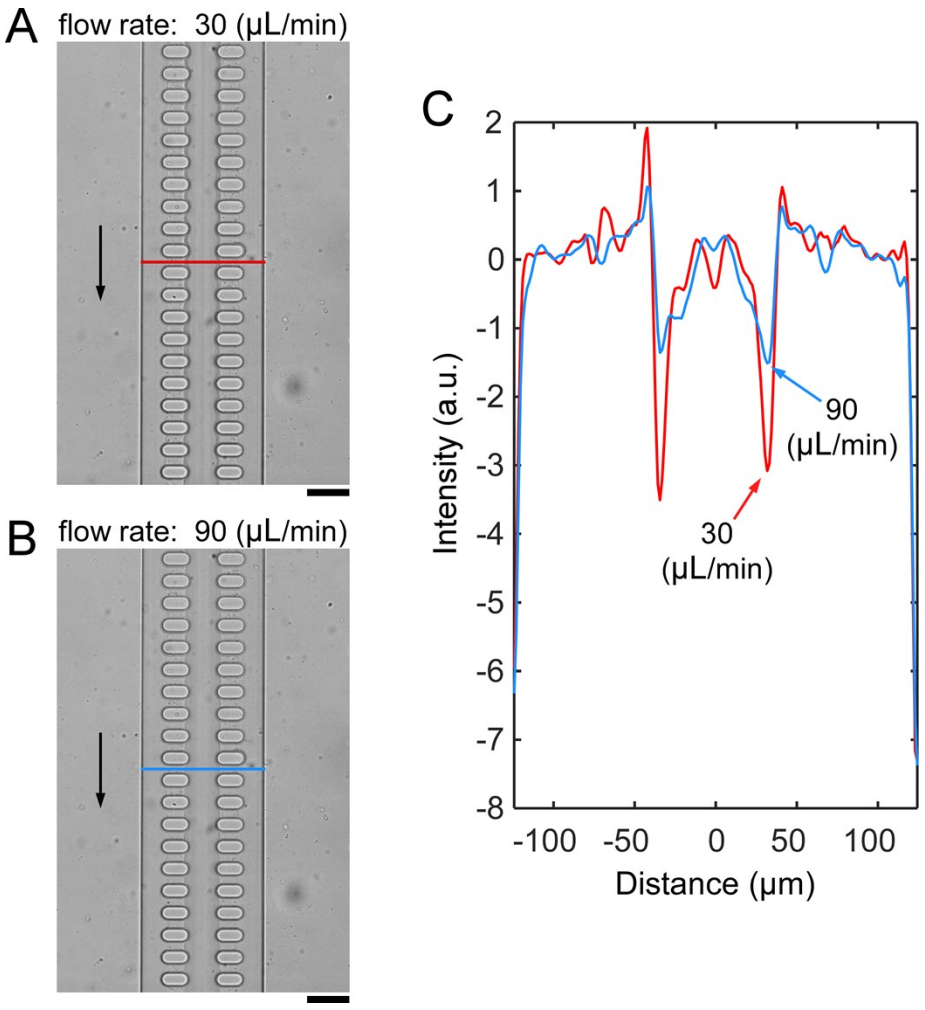

Figure S2 Effect of flow rate on accumulation of retained PLTs. (**A**) Image of a CIF device (f^*_{gap} = 1.04×10^{-4}) operating at a flow rate of 30 μL/min. (**B**) Image of the same device processing the same sample of undiluted PRP at a flow rate of 90 μL/min. Identical imaging conditions were used to capture both images. Arrows indicate the direction of flow. Scale bars are 100 μm. (**C**) Average intensity profiles across the middle channel (red: 30 μL/min, blue: 90 μL/min).

Figure S3

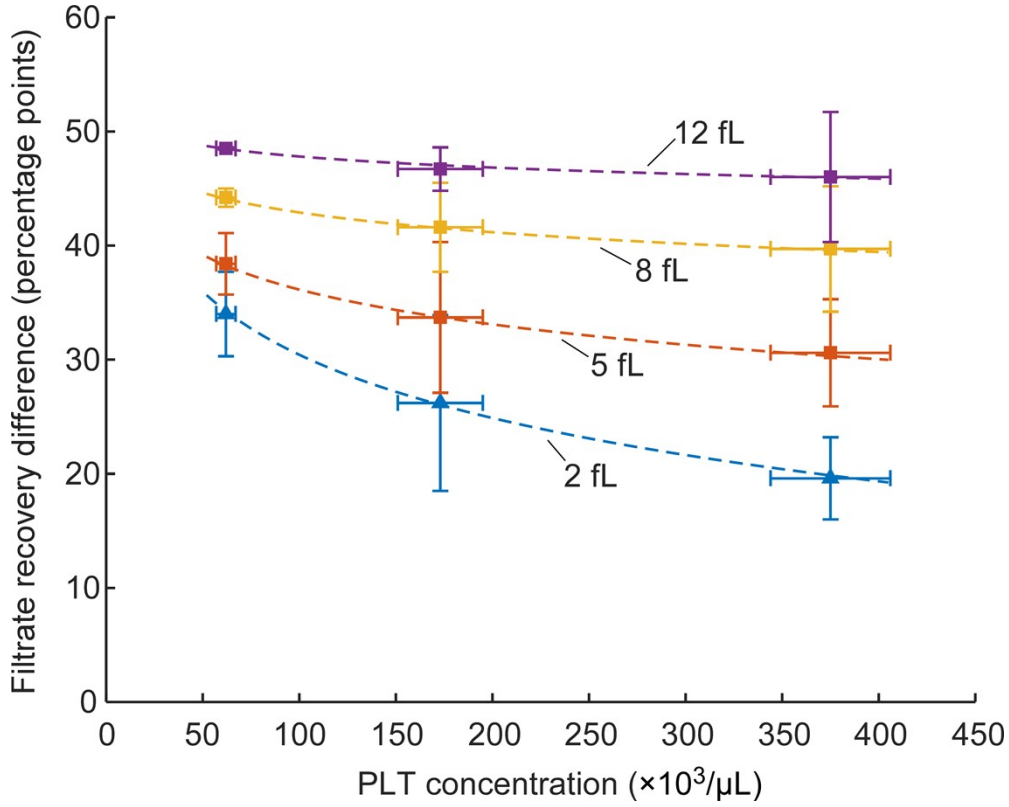

Figure S3 Dependence of the filtrate recovery difference on PLT concentration in the input sample for PLTs with different cell volumes. Values are shown as mean ± standard deviation (n = 3 subjects). Dashed lines indicate best fit curves (2 fL: $y = -8*\ln(x) + 67.26$, $R^2 = 0.9987$; 5 fL: $y = -4.4*\ln(x) + 56.39$, $R^2 = 0.999$; 8 fL: $y = -2.5*\ln(x) + 54.4$, $R^2 = 1.000$; 12 fL: $y = -1.4*\ln(x) + 54.24$, $R^2 = 0.9782$).