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

Supplemental Information for:

Deformability based Sorting of Red Blood Cells Improves Diagnostic Sensitivity for Malaria Caused by Plasmodium Falciparum

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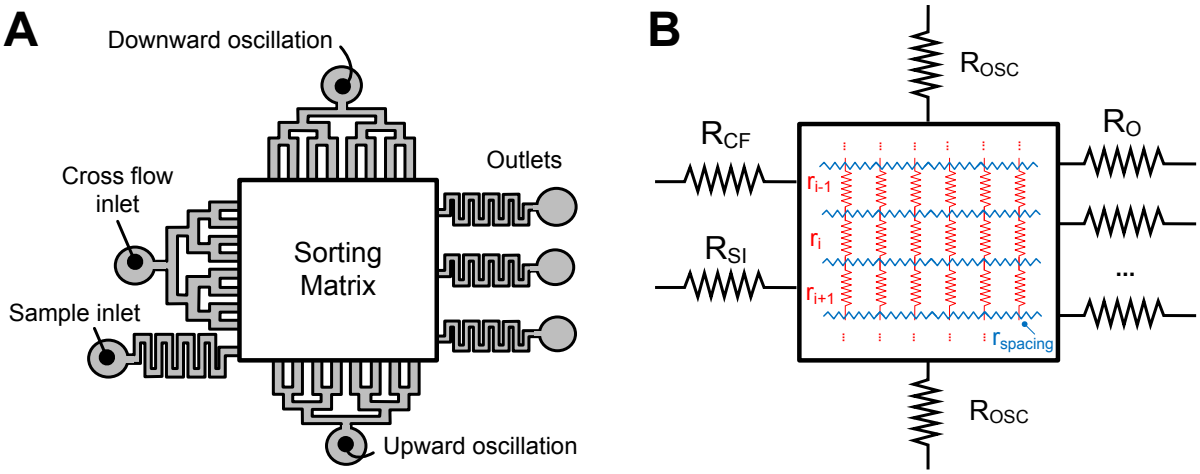
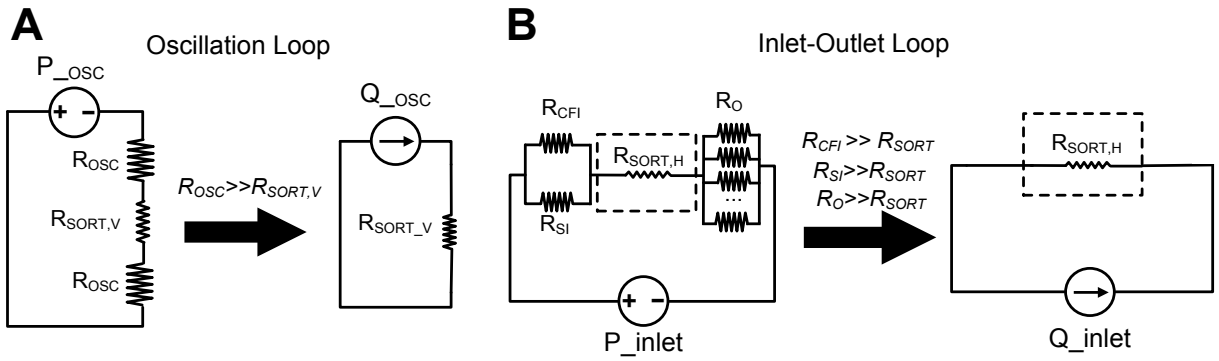
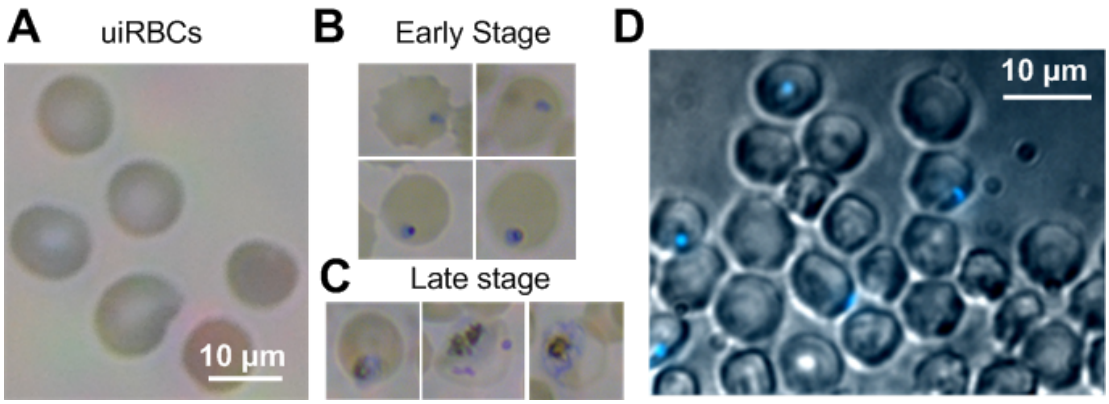
SUPPLEMENTAL FIGURES AND TABLES:



Supplemental Figure 1. Schematic illustration of the microfluidic ratchet sorting device (A) and its equivalent hydrodynamic resistance model (B)



Supplemental Figure 2. Design principle of the microfluidic ratchet sorting device explained using the system hydrodynamic resistance modeling. **(A)** Equivalent hydrodynamic resistance model of the oscillation flow loop. **(B)** Equivalent hydrodynamic resistance model of the inlet-outlet flow loop.



Supplemental Figure 3. Giemsa stain light microscopy for determining pre-sorted sample parasitemia and Hoechst DNA stain of parasitized RBCs at outlets after sorting. Giemsa stain microscopy showing **(A)** uiRBCs as well as *Pf*-iRBCs at **(B)** early (0-24 hours) and **(C)** late stages (24–48 hours). **(D)** Hochest 33342 stain of parasites within the infected RBCs, illuminating parasite DNA under fluorescence microscope.

Supplemental Table 1. Summary of hydrodynamic resistance of ratchet funnel

Pore size (µm)	1.5	1.75	2	2.25	2.5	3	3.5	6	7.5
Hydrodynamic resistance ($\times 10^{14}$ Pa s/m^3)	64.6	46.3	34.9	27.5	22.5	16.1	14.3	12.4	5.07

Supplemental Table 2. Summary of hydrodynamic resistance of various components of the device

Components	**Hydrodynamic resistance ($\times 10^{14}$ Pa s/m^3)**
Cross flow inlet (R_{CF})	150
Sample inlet (R_{SI})	120
Oscillation inlet (R_{OSC})	100
Single outlet channel (R_O)	1200
Sorting region (vertical direction: $R_{SORT,V}$)	1.65
Sorting region (horizontal direction: $R_{SORT,H}$)	20