

## Supporting Information

**SI1** - Capture from 10% spike of MDA-MB-231 cells to lysed blood run at a rate of 0.20 mL/hr. The video shows the MDA cells fluorescing in white while being washed with 3% bovine serum albumin in phosphate buffered saline. The videos were recorded using a 4× objective lens with a 0.13 NA. The cells have been stained with MitoTracker Green.

**SI2** - Capture from 0.1% spike of MDA-MB-231 cells to lysed blood run at a rate of 0.20 mL/hr. The video shows the MDA cells fluorescing in white while being washed with 3% bovine serum albumin in phosphate buffered saline. The videos were recorded using a 4× objective lens with a 0.13 NA. The cells have been stained with MitoTracker Green.

**SI3** – The video shows the motion of white blood cells (fluorescing white) stained with propidium iodide. Flow direction from inlet to outlet at a rate of 0.20 mL/hr. The videos were recorded using a 4× objective lens with a 0.13 NA.

**SI4** - The video shows the motion of white blood cells (fluorescing white) stained with propidium iodide. Flow direction from outlet to inlet at a rate of 0.20 mL/hr. The videos were recorded using a 4× objective lens with a 0.13 NA.