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

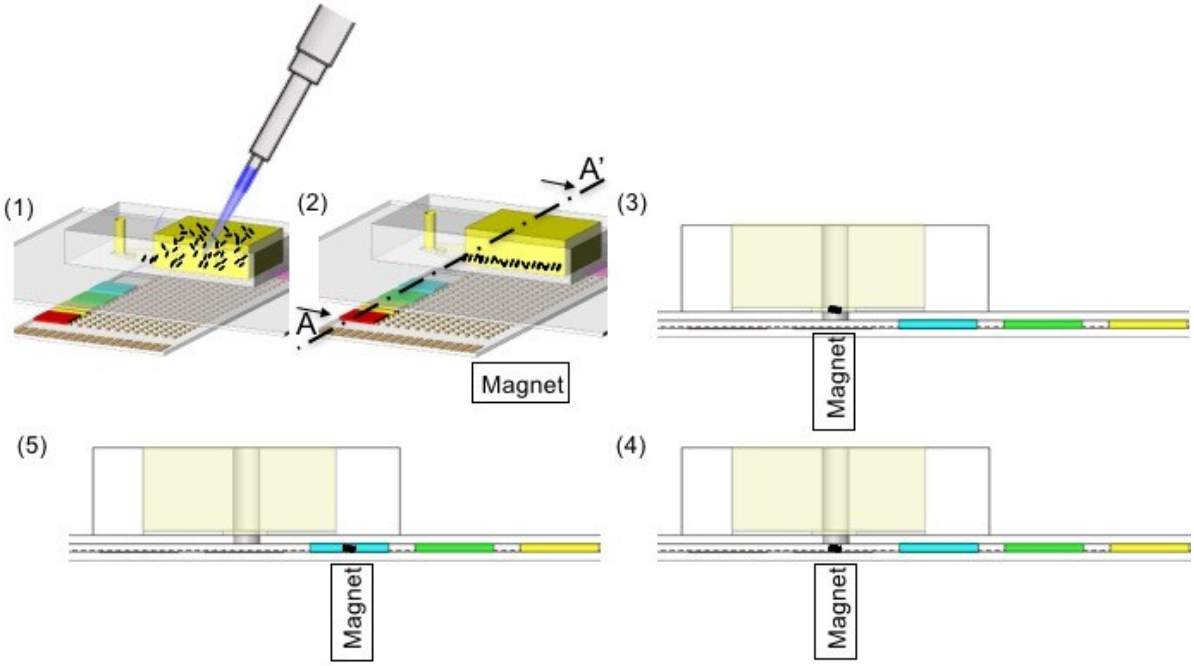

Figure S1: Protocol for sample pre-concentration and DNA amplification using RPA on DMF platform. Reservoir electrodes on the TFT backplane are loaded with reagents, represented by different colors. Red: magnesium acetate, yellow: RPA mastermix, green: NTC, blue: elution buffer and purple: positive DNA control. (1) Urine sample spiked with lysed bacteria and magnetic beads as prepared in Figure 1(A) is introduced into the sample chamber. (2) The sample capillary fills the bottom channel of the sample pre-concentration unit. A permanent magnet is used to pull the beads to the bottom of the sample channel and then across. (3-5) shows the cross section of the platform from section A-A'. (3 & 4) Using the magnet, beads are pelleted and pulled through the hole in the top substrate onto a reservoir pad. (5) Beads translated moved through the oil onto a neighboring reservoir pad with elution buffer and incubated for five minutes. Diagram not to scale.

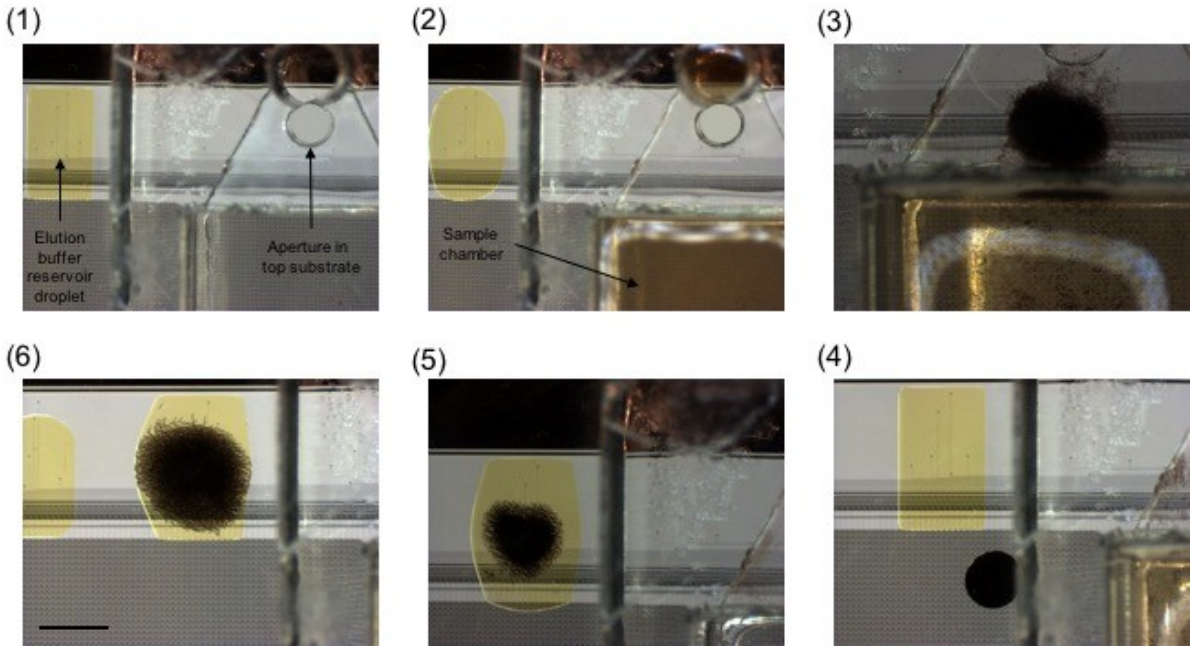

Figure S2: Microscope images of the sample pre-concentration sequence. (1) RPA reagents are loaded onto the fluid input electrodes of the TFT backplane and the DMF platform is assembled. The reservoir electrodes are actuated to pin down the droplets while the gap between top substrate and TFT backplane is filled with oil. (2) Urine sample is loaded into the pre-concentration unit. (3) Beads are pulled down using a magnet and then moved through the hole in the top substrate. (4) Beads are pulled through the oil-urine interface at the hole. (5) The beads are moved again through the oil phase into the elution buffer reservoir (yellow dye). (6) Beads are dispersed with magnet in the elution buffer reservoir and left to incubate for 5 minutes. Beads are then pulled out of the elution buffer into the oil phase where they are discarded, and daughter droplets are dispensed from the reagent reservoirs for DNA amplification. Scale bar: 3 mm

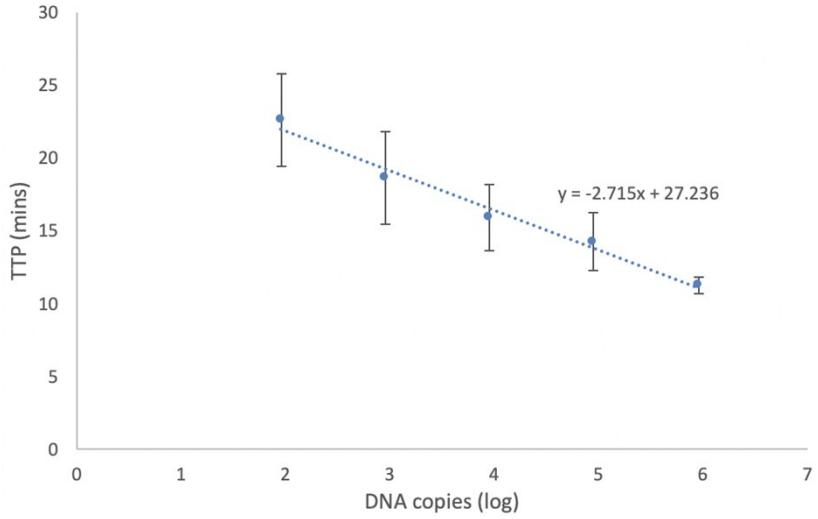

Figure S3: Plot of time to positivity (TTP) vs $\log_{10}$ purified DNA (genomic and plasmids) concentration, extracted using DNeasy Blood and Tissue Kit (Qiagen, UK). Data is average of triplicates.

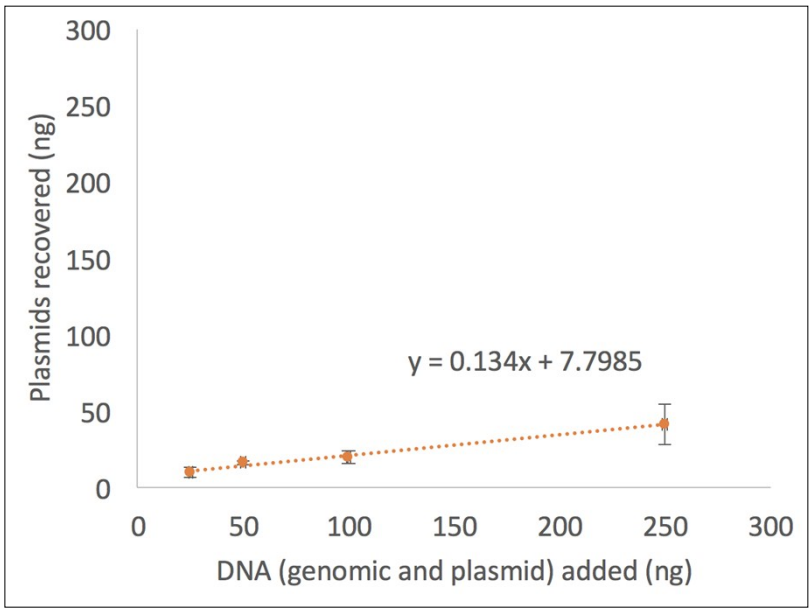

Figure S4: Plot of amount of purified DNA (in ng) added to 3M GuHCl (1 mL) and processed on DMF platform using described protocol. The beads are re-suspended into 5 µL of elution buffer and quantified using a nanodrop.