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A Surface Topography Assisted Droplet Manipulation Platform for Biomarker Detection and Pathogen Identification

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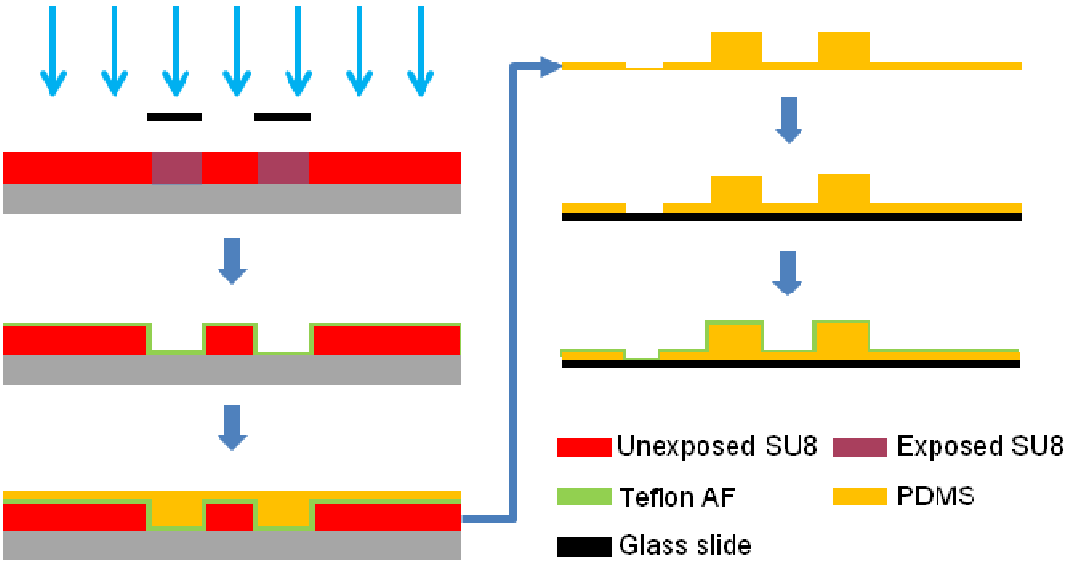

Supplementary Fig. S1: Fabrication process flow. The photoresist of ~600μm thick is spun on by multiple spin coating. The features are lithographically patterned and dip-coated with Teflon AF after the hard bake. PDMS is spun onto the mold and cured at 80°C after which the PDMS membrane is peeled off and the reaction basins are punched using a 4mm hollow puncher. At last, the PDMS membrane is rolled onto the glass coverslip and dip-coated with Teflon AF. Alternatively, the mold can be fabricated by micromachining on a PTFE substrate.

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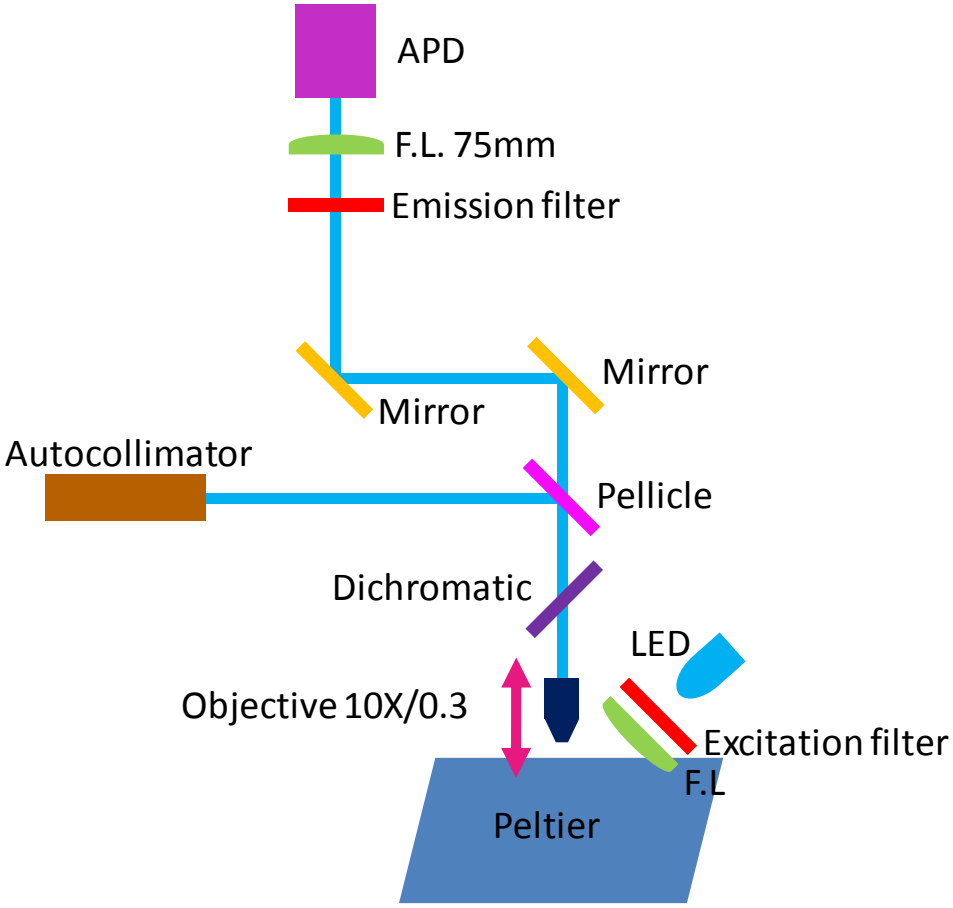

Supplementary Fig. S2: The optical setup configuration. F.L.=focusing lens. A 480/BP40 excitation filter and a 520/BP40 emission filter were used to accommodate the fluorophores used in this study.

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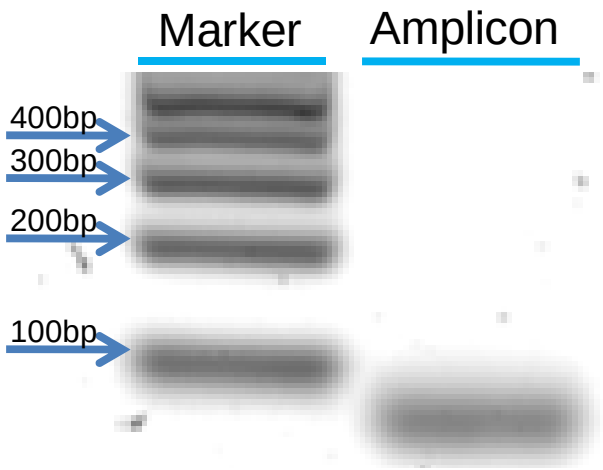
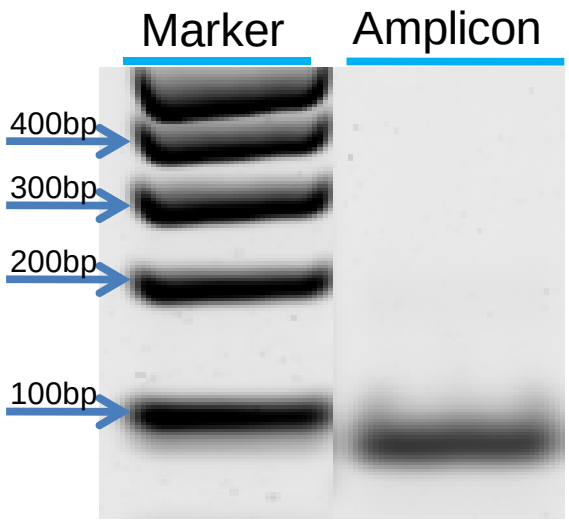


Supplementary Fig. S3: PCR Amplicon of Rsf-1 gene is collected and run on a 2% agarose gel at 8V/cm for 90 mins.



Supplementary Fig. S4: HDA Amplicon of Rsf-1 gene is collected and run on a 2% agarose gel at 8V/cm for 90 mins.

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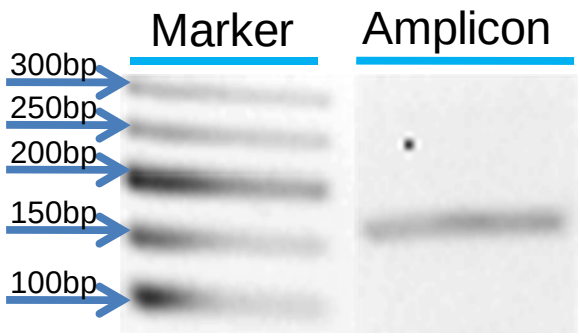
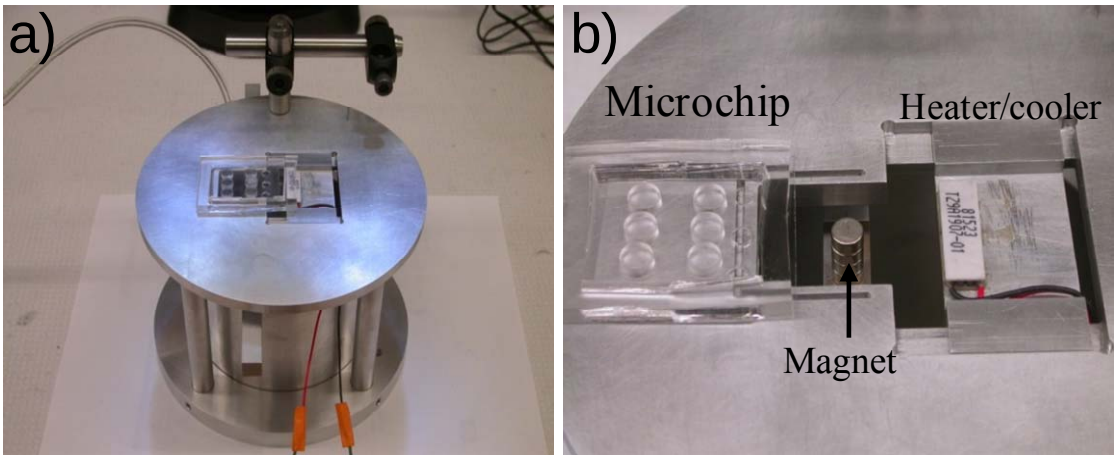


Supplementary Fig. S5: PCR Amplicon of E.coli 16S gene is collected and run on a 2% agarose gel at 8V/cm for 90 mins.



Supplementary Fig. S6: Photographs of the actual device. a) The overall view. A T-bar is mounted to hold the temperature sensor. b) The zoomed view featuring the microchip, the magnet holder bar and the slider with the micro heater/cooler.

Supplementary video: Demonstration of manipulating droplets with the assistance of the surface topographic features.