

Electronic Supplementary Information

A Novel Picoliter Droplet Array for Parallel Real-time Polymerase Chain Reaction Based on Double-inkjet Printing

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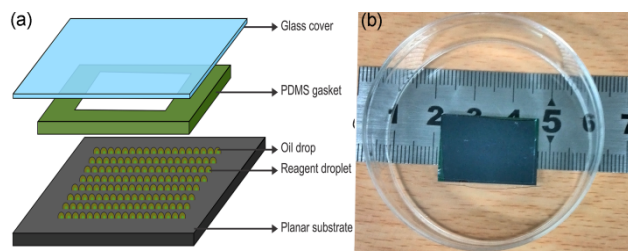


Fig. S1 (a) Schematic diagram of chip package: A typical chip with the compound droplet array is surrounded by a PDMS gasket, filled with mineral oil, and sealed with a glass coverslip. The spacer and coverslip seal the droplets in the chamber to prevent evaporation. (b) Bright-field image of the chip package containing the isolated droplets array after sealing, displayed on a ruler to show scale.

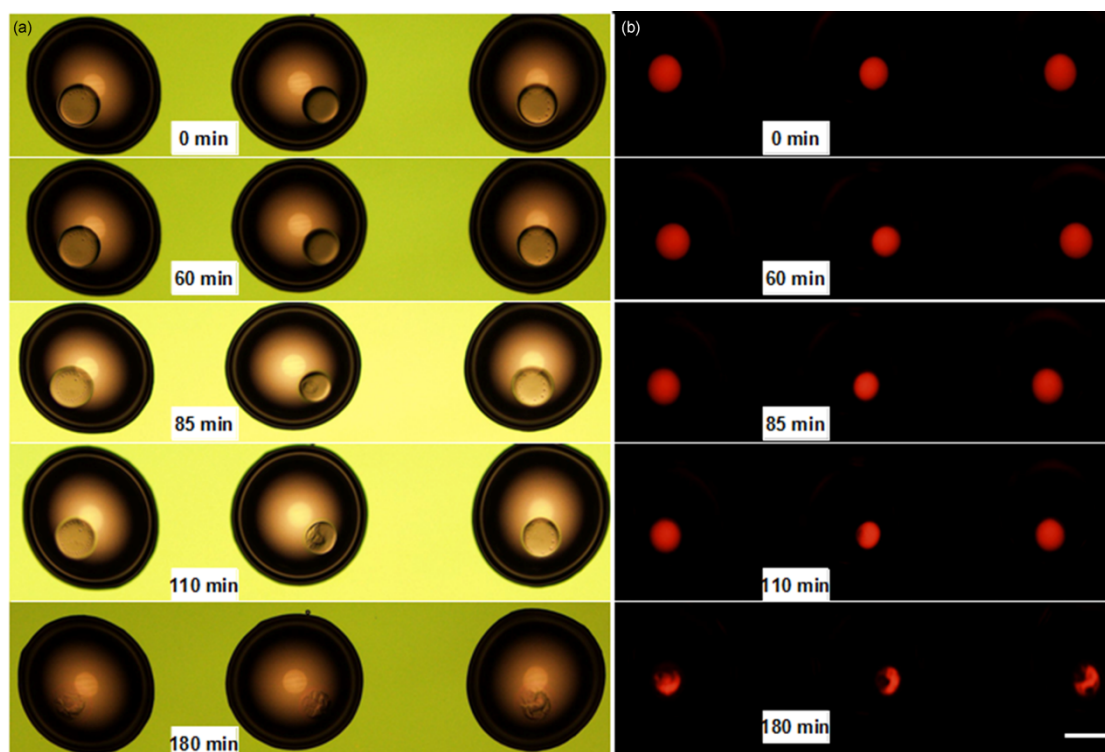


Fig. S2 (a) Optical and (b) fluorescence images of droplet-in-oil array after standing at room temperature for 3 h. From top to bottom, no significant change in spot morphology is evident after ~60 min at room temperature. Droplets in oil start volatilizing after ~85 min (scale bar 500 μm).

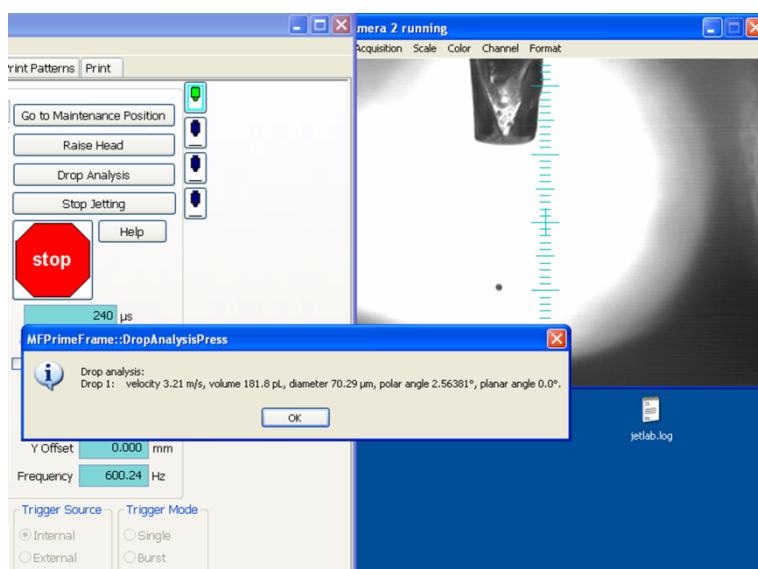


Fig. S3 Screenshot of stroboscopic image and result of software analysis showing the accurate volume and velocity of a pinched-off droplet.

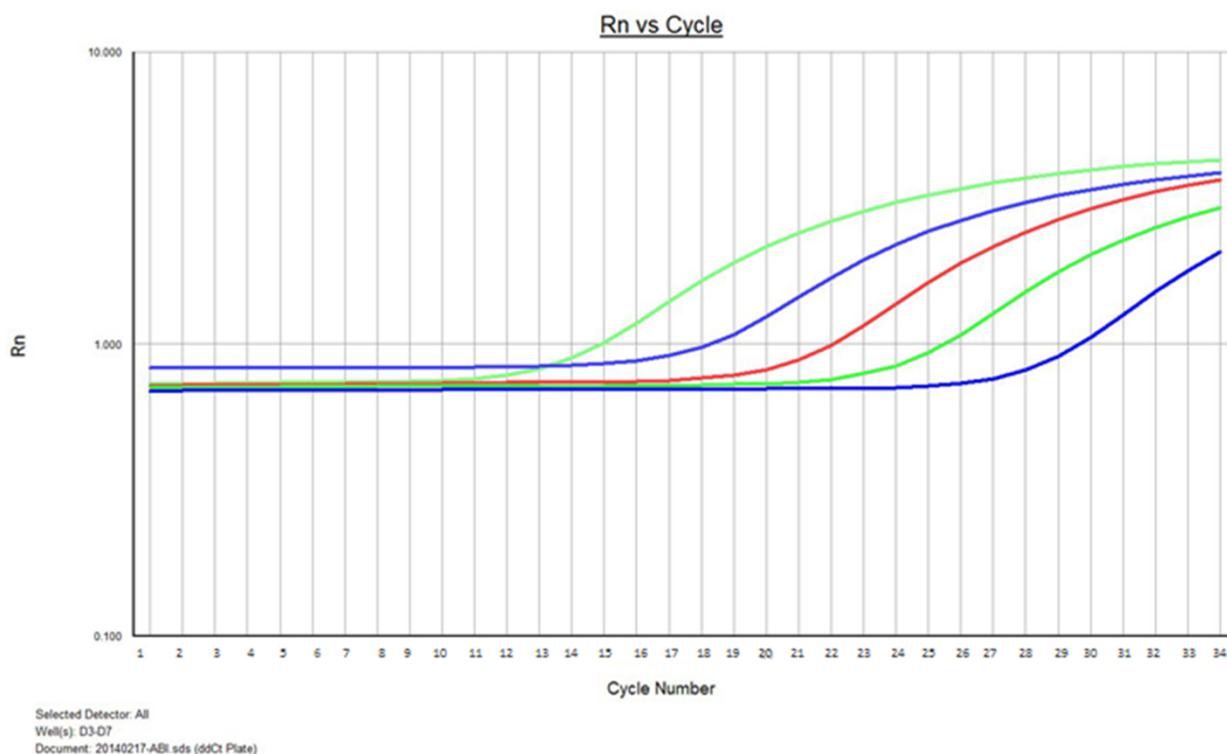


Fig. S4 Real-time amplification plots for a 1/10 dilution series of cDNA over five orders of magnitude from 500 to 0.05 pg/μL.

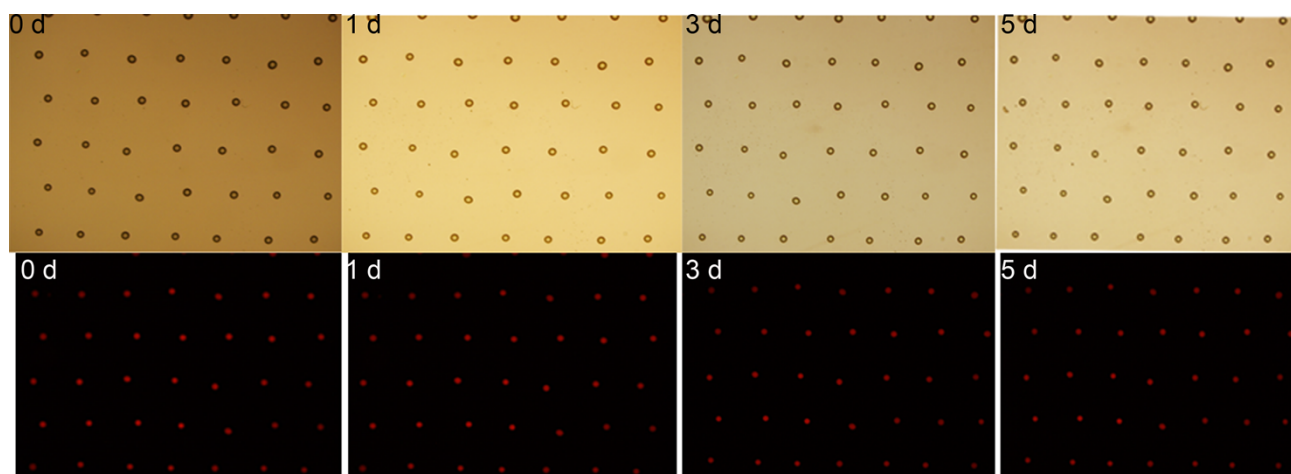


Fig. S5 Bright and fluorescent images of the droplet array sealed in the oil layer after standing at room temperature for 5 d. There were no obvious changes in the droplet size as determined by the bright images and fluorescence intensities in the fluorescent images.

Movie S1. Video showing the slippage of reagent droplets from the impact site on the spherical oil drop to the side edge, instead of penetrating into it.

Movie S2. Video showing the typical process for realizing a droplet-in-oil array based on double-inkjet printing.