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

Supporting Information

A Hand-Powered Microfluidic System for Portable and Low-Waste Sample Discretization

Tengbao Xie[a], Ping Wang[b], Lei Wu[c], Bangyong Sun[a], Qiang Zhao[a], and Gang Li[a, *]

[a]*Key Laboratory of Optoelectronic Technology and Systems, Ministry of Education, Defense Key Disciplines Lab of Novel Micro-Nano Devices and System Technology, Chongqing University, Chongqing 400044, China*

[b]*Department of Biochemistry and Molecular Biology, Medical College, Henan University of Science and Technology, Luoyang, 471023, China*

[c]*State Key Lab of Transducer Technology, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences, Shanghai 200050, China*

[*]Corresponding author. Tel: +86-23-65111011(G. Li)

[*]Email address: gang_li@cqu.edu.cn (G. Li).

S1. Automatic positive microwell counting with ImageJ

ImageJ is an open-source and widely-used image processing software developed by the National Institute of Health (NIH). Here, we used ImageJ as a tool for counting the positive microwells in the dPCR chip after PCR thermocycling. The detailed procedure is shown below:

1. Load the image which is needed to count. To do this, select: *File > open.*
2. Convert the image to grayscale. To do this, select: *Image > Type > 8-bit Grayscale.*
3. Adjust the threshold to distinguish positive wells from the background. To adjust the threshold, select: *Image > Adjust > Threshold.*
4. Identify and count the positive wells. To do this, select: *Analyze > Analyze Particles.*

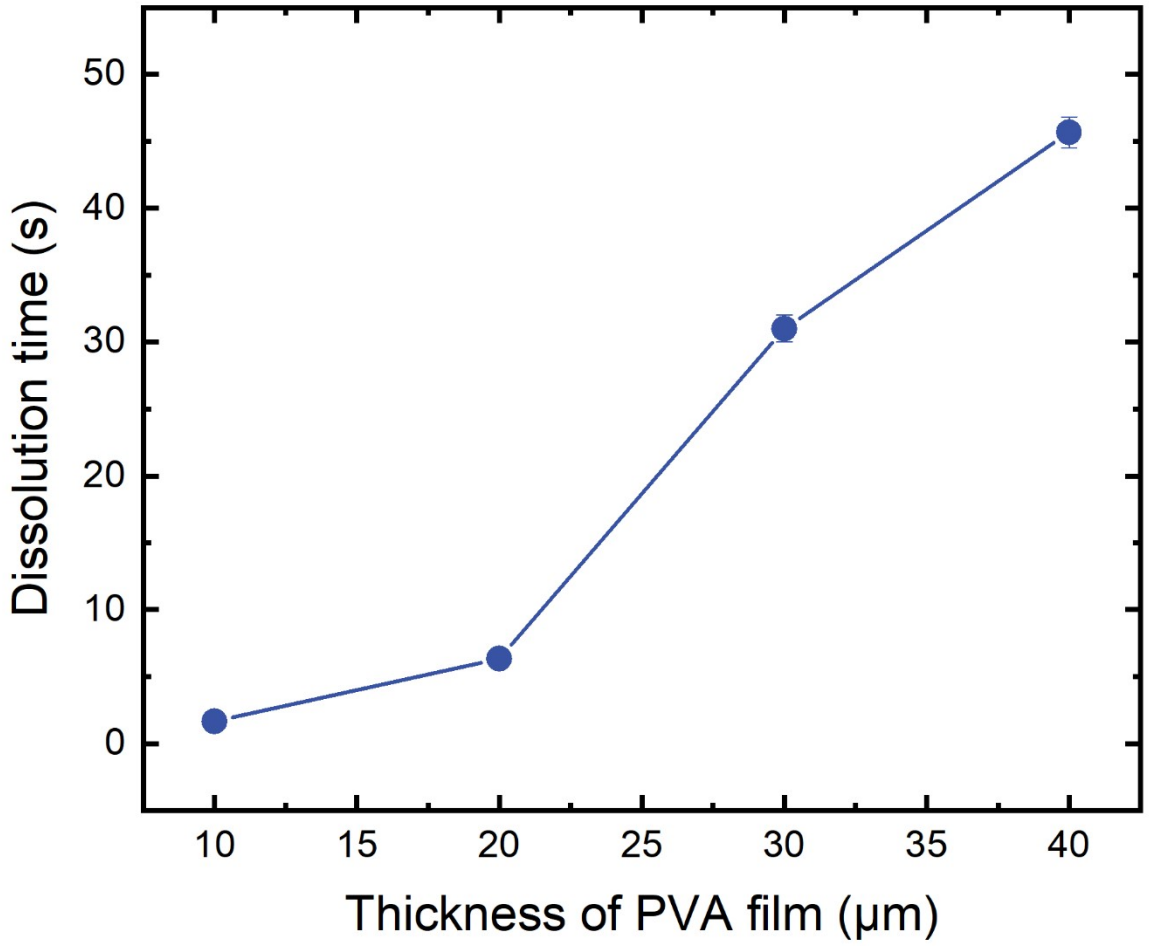

Figure S1. Characterization of time delays created by dissolution of different thickness of PVA film. Note: If no error bars are shown, the s.d. is smaller than the size of the symbol representing the mean in the graph.

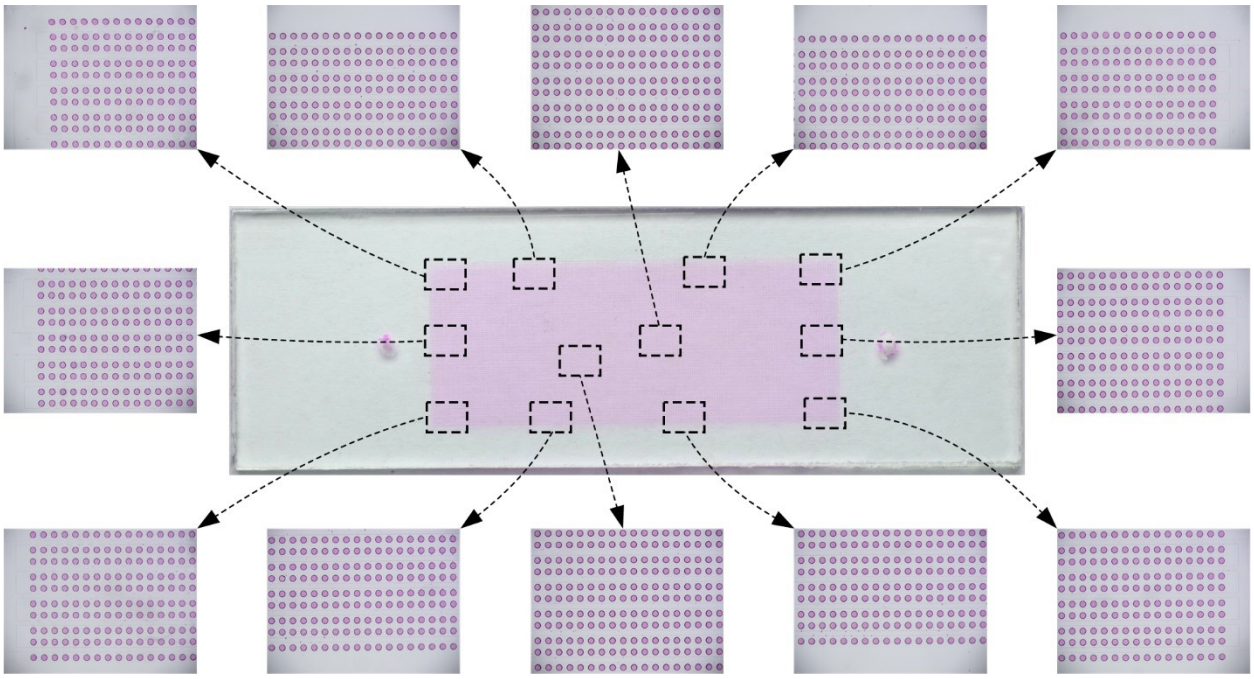

Figure S2. Microscopic images of the partitioned droplets at twelve representative positions randomly selected from the microwell array chip. All images show 100% filling and discretization of sample, demonstrating that our sample dicretization system can provide a robust and effective means to generate monodisperse partitions for digital bioassays.

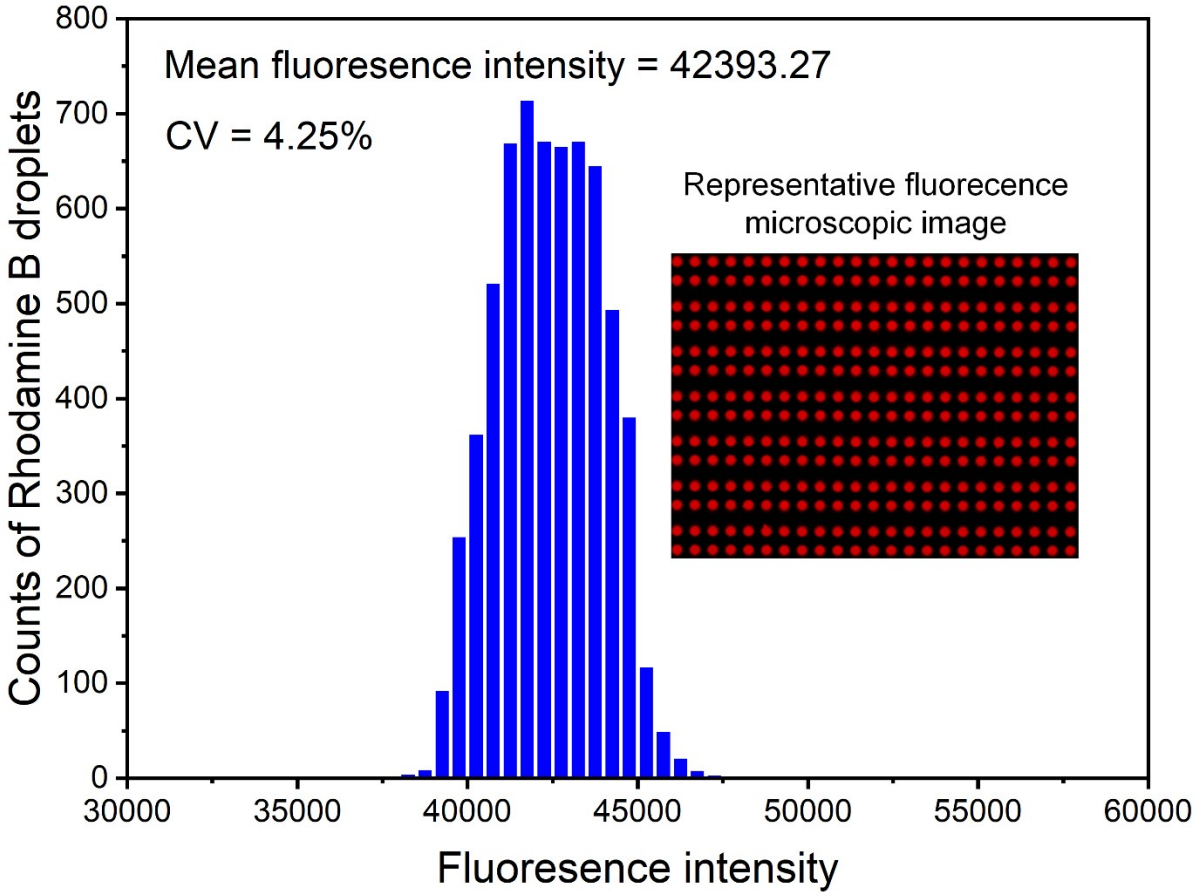

Figure S3. Histogram of the distribution of the total fluorescence intensities of 6,400 partitioned Rhodamine B droplets randomly selected from a discretized chip.