Supplemental Information

An Automated Microfluidic DNA Microarray Platform for Genetic Variants Detection in Inherited Arrhythmic Diseases

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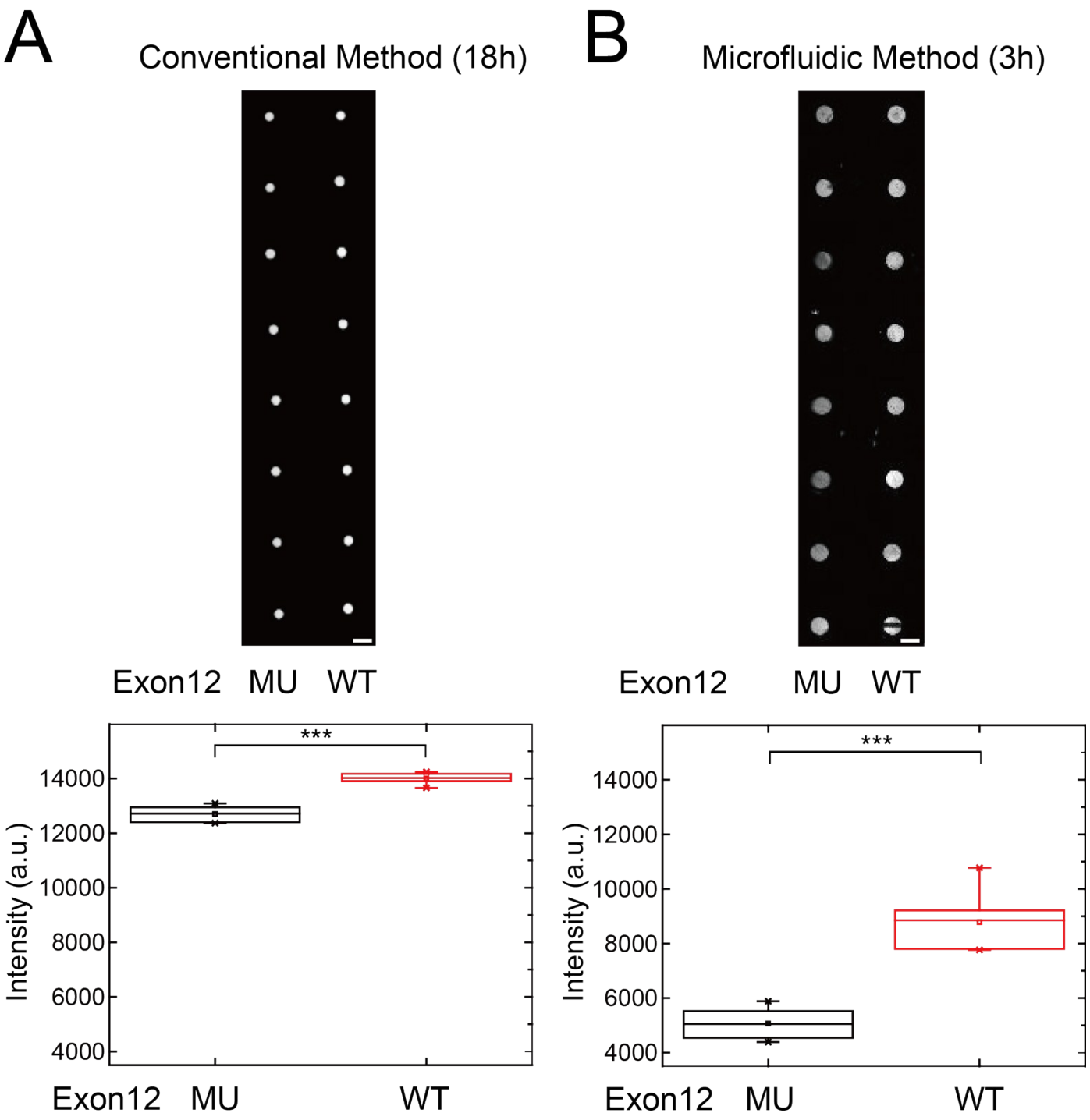


Figure S1 Comparison between (A) the conventional and (B) the microfluidic hybridization method using CY3 labeled oligonucleotide exon 12 WT as the target DNA sample. The graph below each figure shows the average fluorescent intensity of each column. Both methods can achieve a significant hybridization signal differentiation with p-value < 0.001. Scale bar: 100 μm

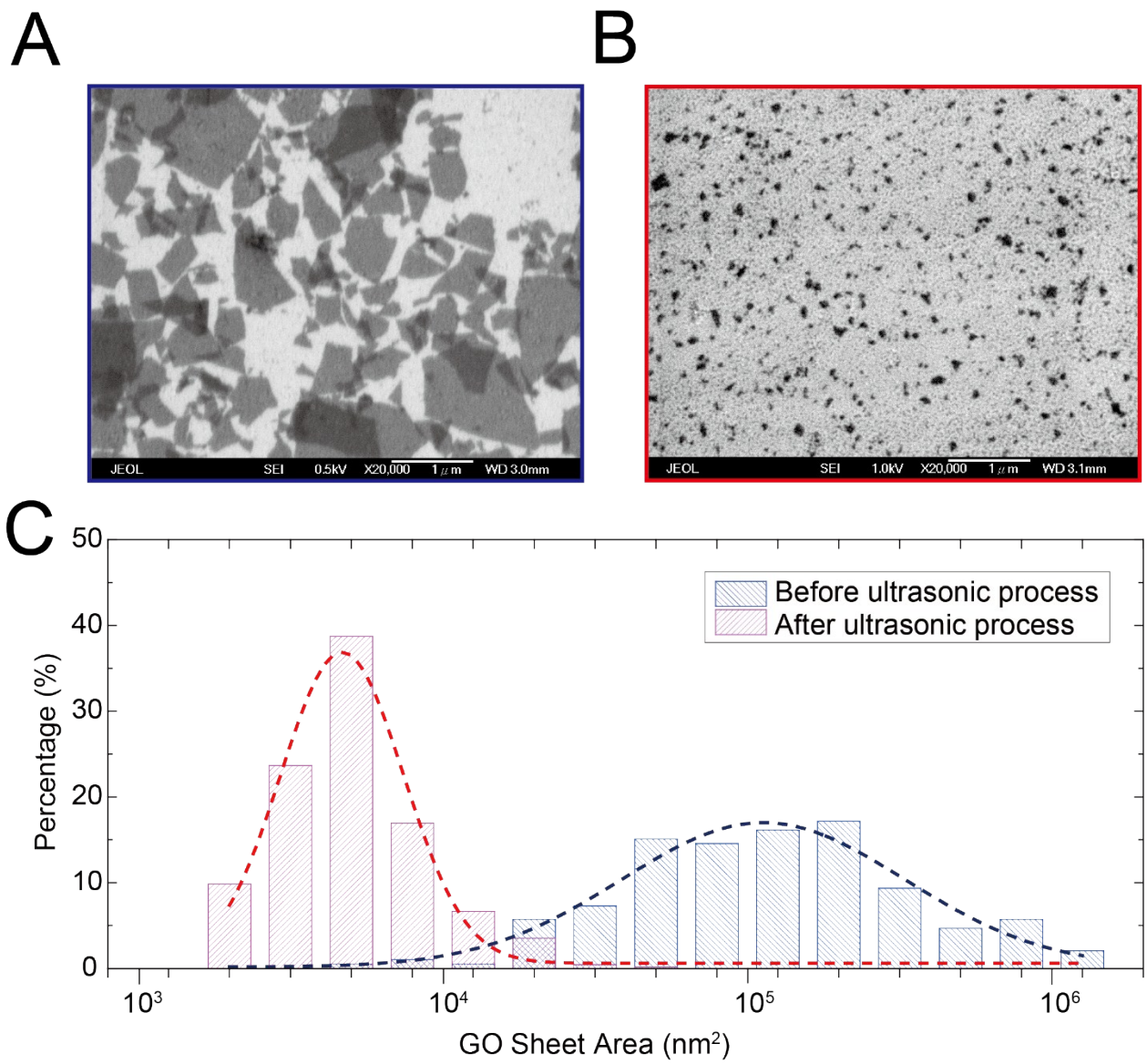


Figure S2 SEM image of a GO sheet (A) before the ultrasonic process and (B) after the 3-hour ultrasonic process. Scale bar: 1 μm. (C) The histogram and Gauss fitting curve of the area distribution indicate the GO sheet area is between 2 x 10^4 to 1.2 x 10^6 nm^2 and 2 x 10^3 to 2 x 10^4 nm^2 before and after the ultrasonic process, respectively.

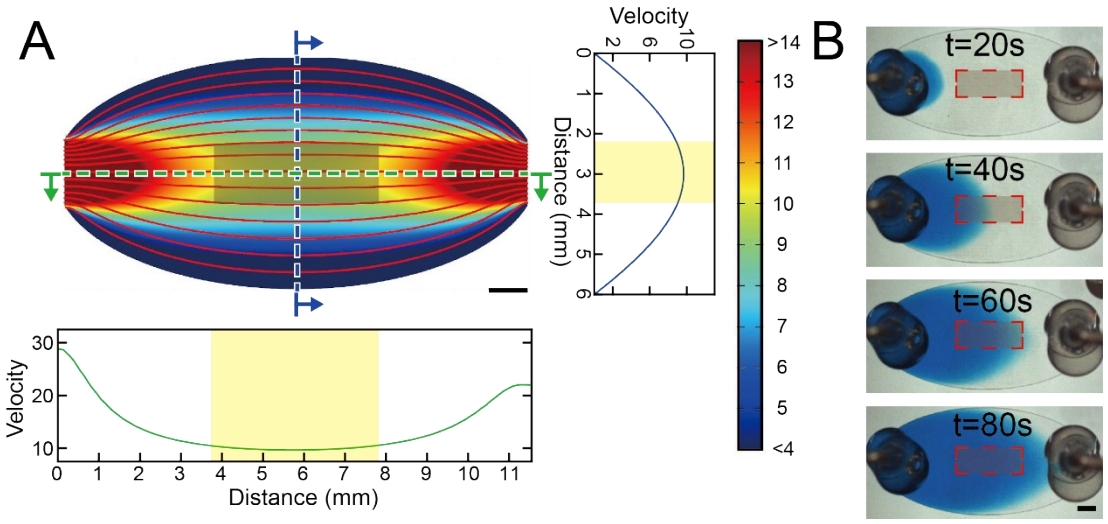
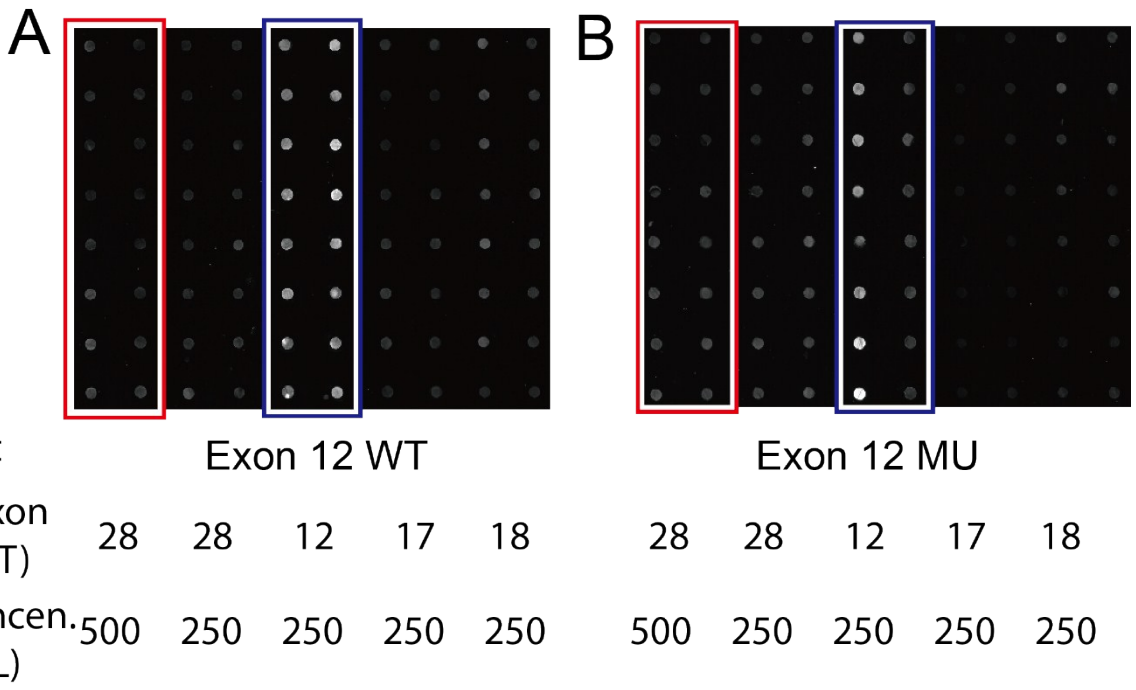


Figure S3 Finite element simulation of elliptical microchannel without pillar array. (A) Velocity field and flow streamline profile in the elliptical microchannel. The side and bottom figures show the detailed velocity profiles along the blue axis and green axis. The yellow section represents the designed hybridization area with only a 10% velocity difference. (B) Temporal sequence of photos showing the uniform flow pattern in the designed hybridization area. Scale bar: 1 mm.



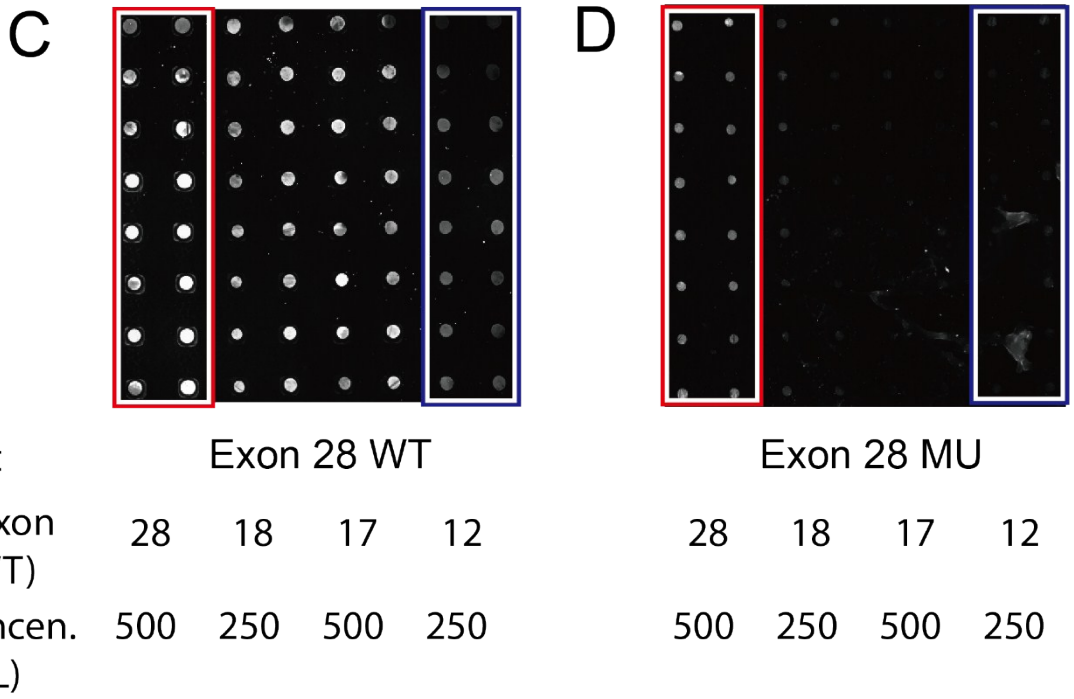


Figure S4 Complete microarray hybridization image from Fig. 6 with detailed probe information.