

Electronic Supporting Information (ESI)

Wash-free magnetic immunoassay of the PSA cancer marker using SERS spectroscopy and droplet microfluidics

Rongke Gao,^{†a} Ziyi Cheng,^{†a} Andrew J. deMello^b and Jaebum Choo^{*a}

^aDepartment of Bionano Technology, Hanayng University, Ansan 426-791, South Korea.

^bDepartment of Chemistry and Applied Biosciences, Institute of Chemical and Bioengineering, ETH Zürich, Vladimir Prelog Weg 1, 8093 Zürich, Switzerland

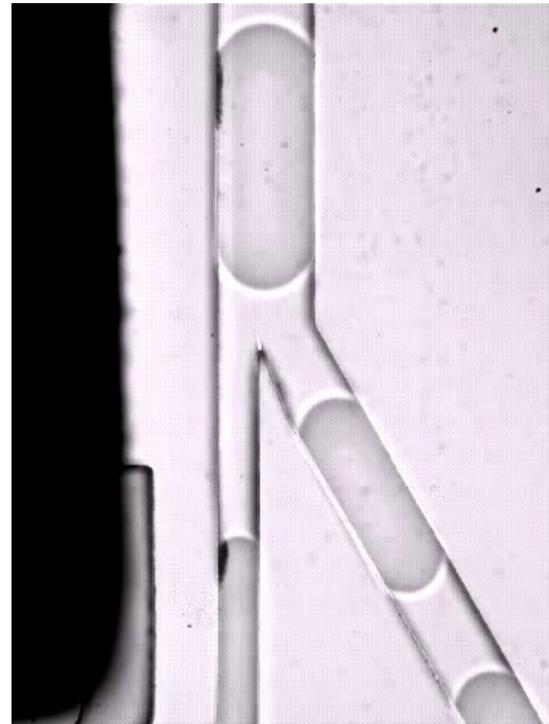
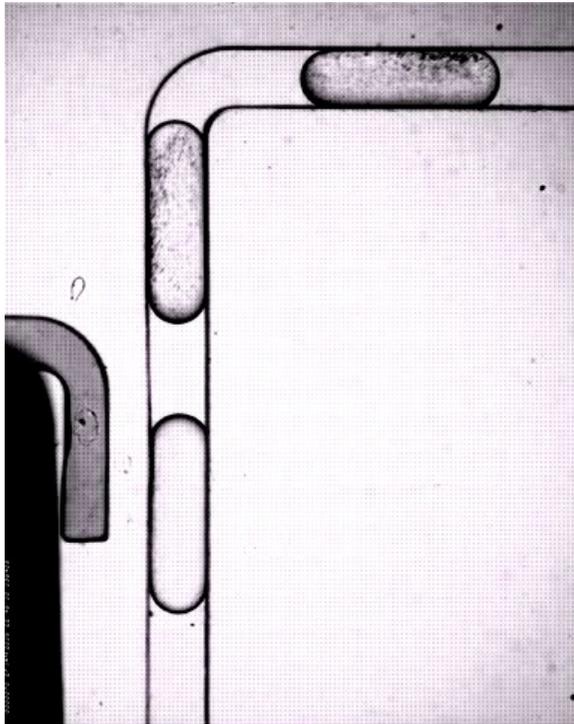
List of Contents

Movie S1. Isolation process of magnetic immunocomplexes (left) and the droplet fission process (right). This movie demonstrates the real-time tracking of individual droplets before and after the droplet fission.

Fig. S1. (a) Schematic of experimental setup comprising the microdroplet chip, Raman instrument and two syringe pumps. (b) Optical arrangement for focusing the laser on the capture area of the channel.

Fig. S2. Variation of droplet generation frequency as a function of Q_{ratio} .

Fig. S3. (a) SERS spectra of supernatant droplets (concentration of PSA marker = 200 ng/mL) for different Q_{ratio} values at the position indicated in the photograph. (b) Variation of the SERS intensity at 1612 cm^{-1} as a function of Q_{ratio} . Error bars indicate the standard deviation of three measurements.



Movie S1

(a)



(b)

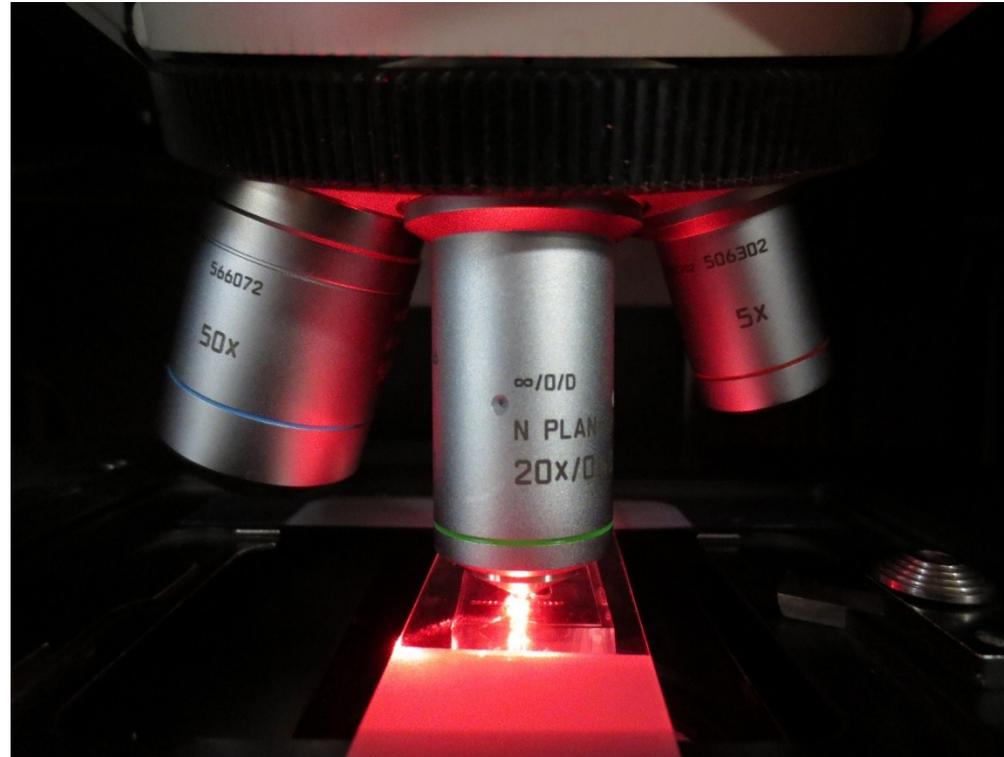


Figure S1

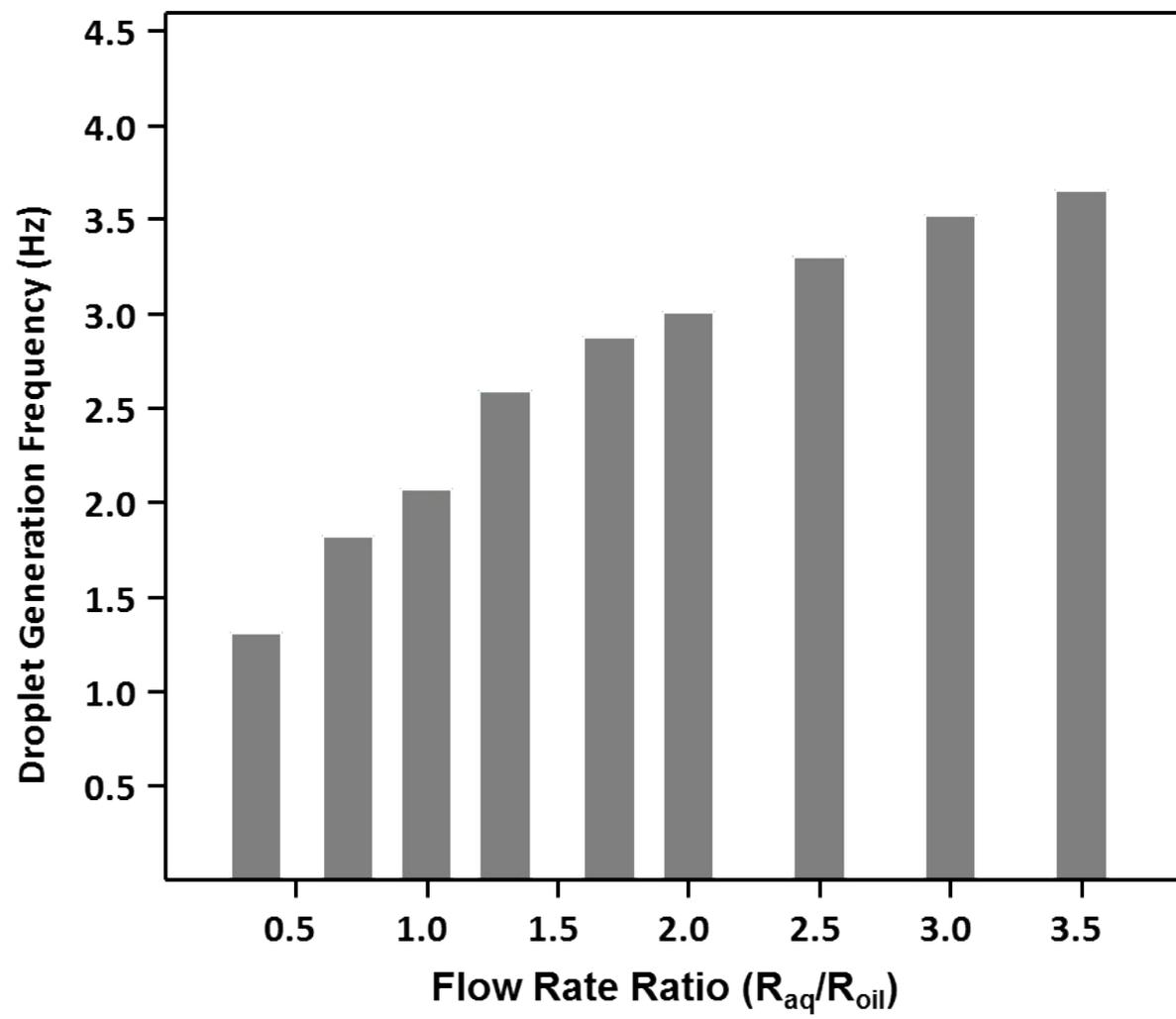


Figure S2

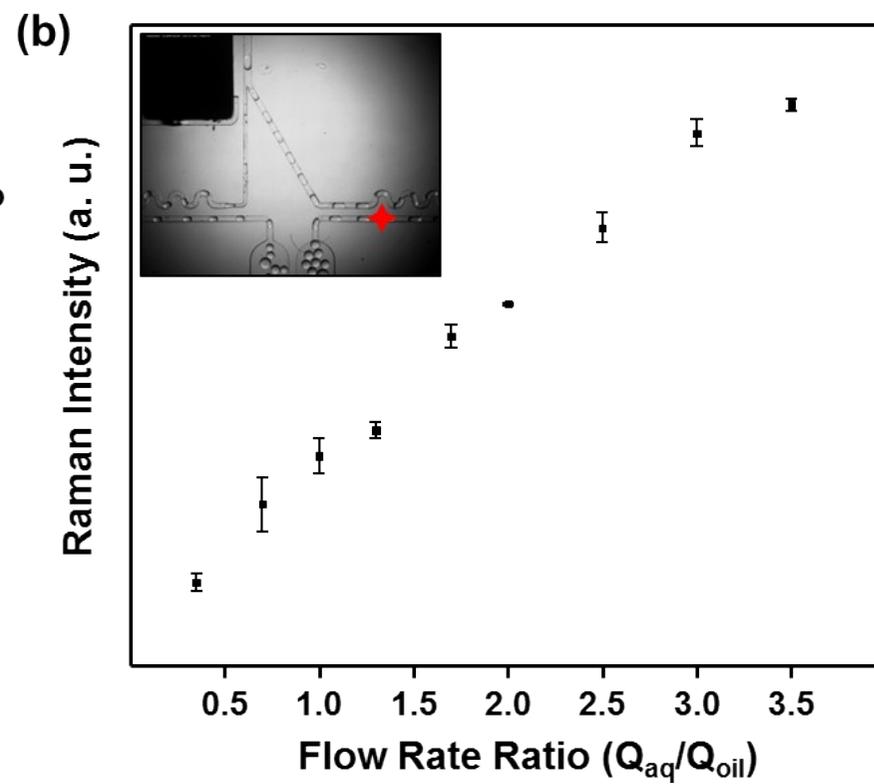
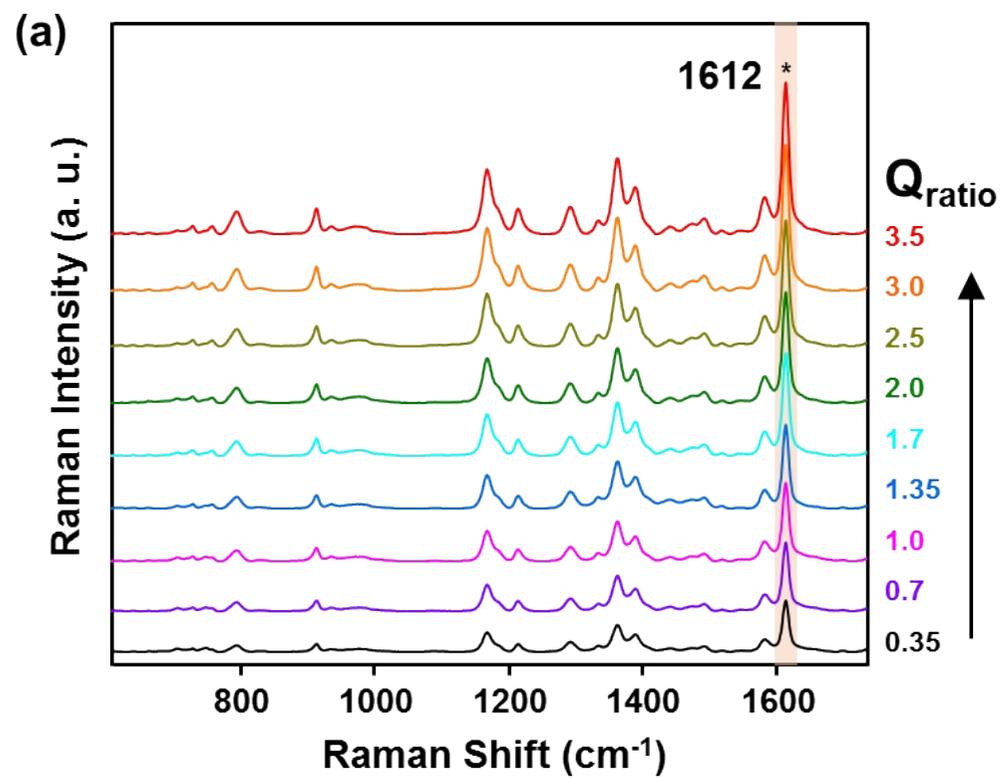


Figure S3

Table S1. Flow rate conditions for droplet generation. Frequencies were optimized for SERS detection.

Flow rate conditions	R _{oil} (μl/min)	R _{water} (μl/min)	Q _{ratio} = R _{Water} /R _{Oil}
A	3	1.05	0.35
B	3	2.1	0.7
C	3	3	1
D	3	4.05	1.35
E	3	5.1	1.7
F	3	6	2
G	3	7.5	2.5
H	3	9	3
I	3	10.5	3.5