Electronic Supporting Information (ESI)

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

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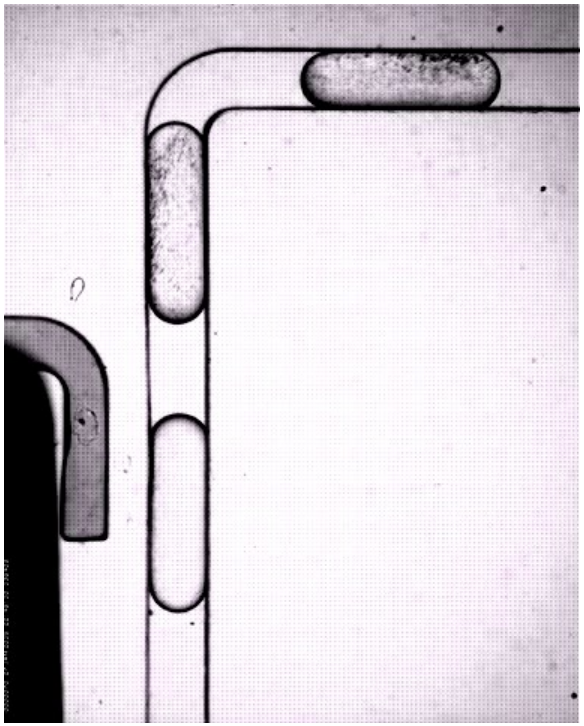
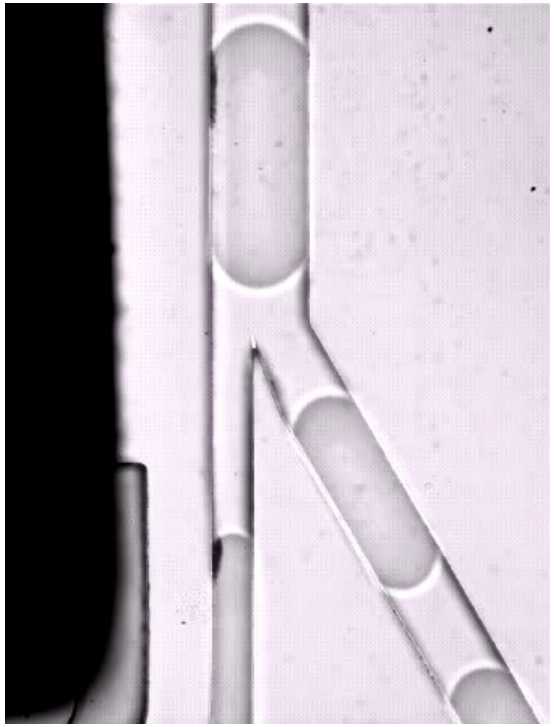
List of Contents





Movie S1

(a)

(b)

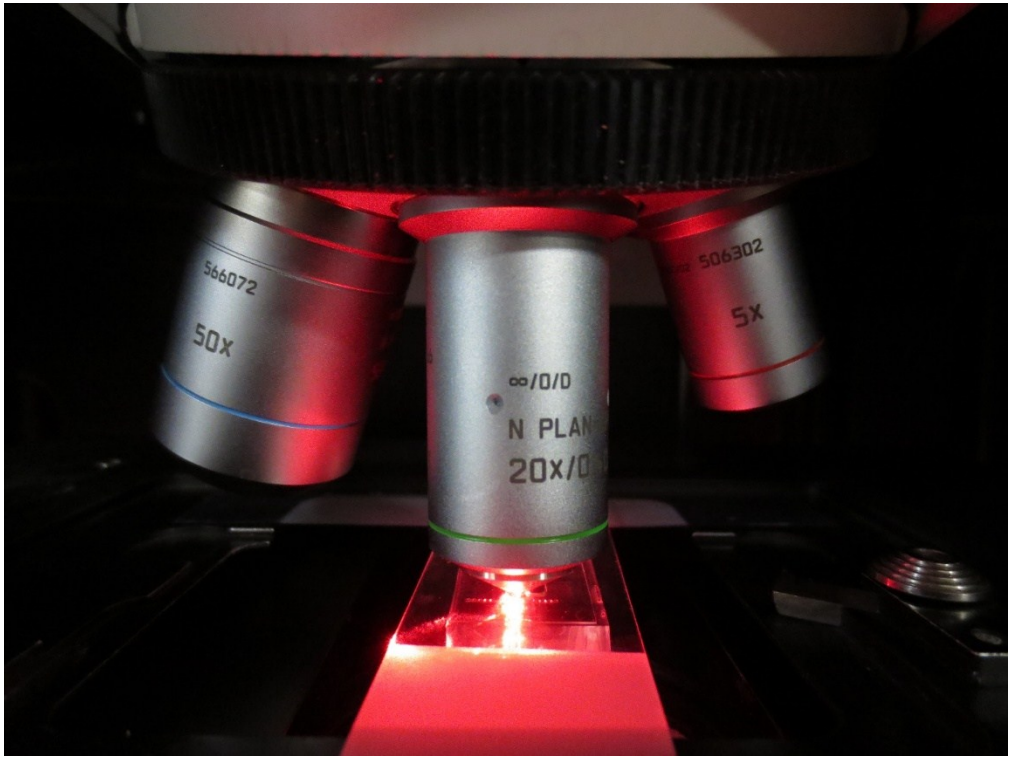


Figure S1

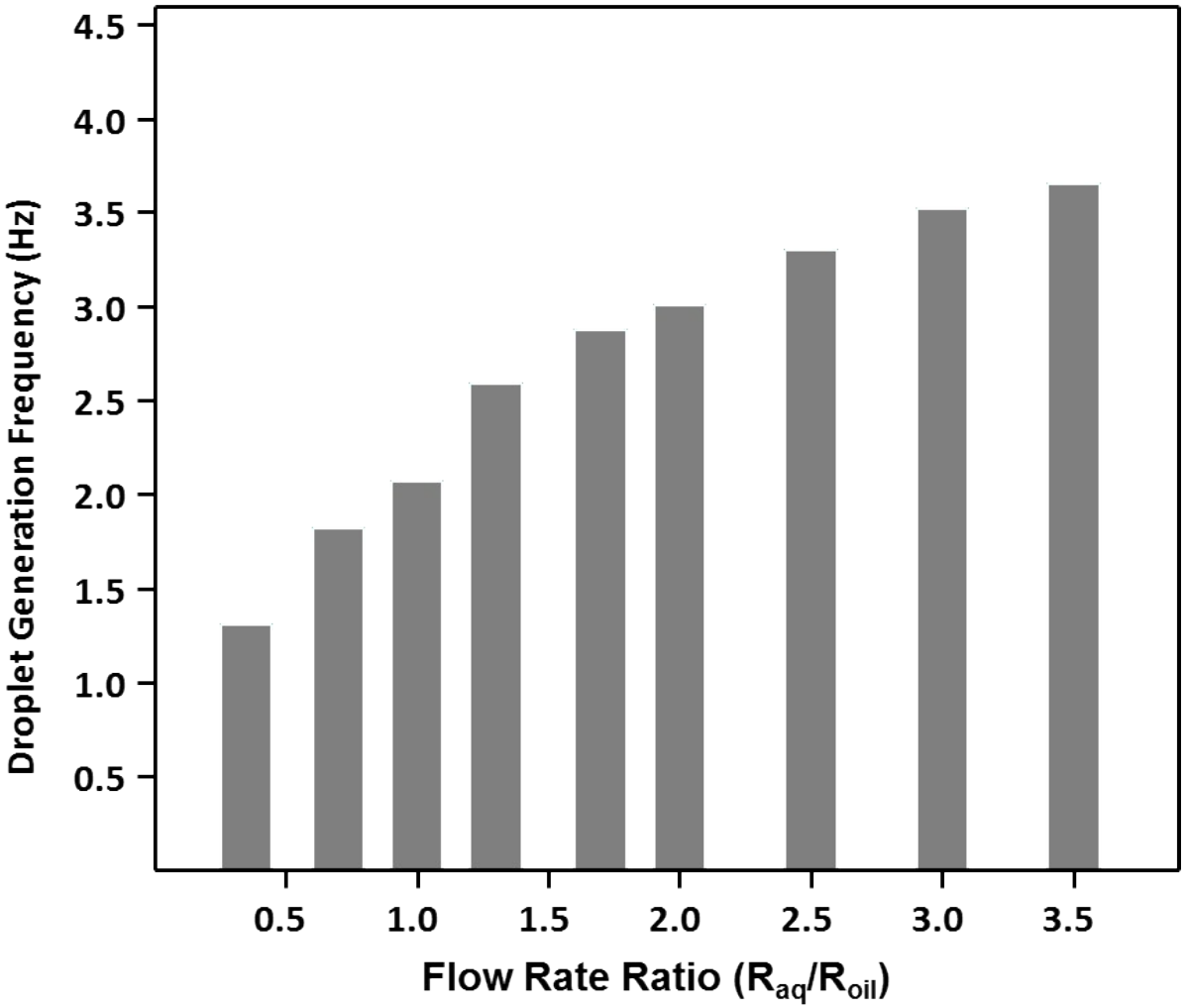

Droplet Generation Frequency (Hz)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flow Rate Ratio (R_{aq}/R_{oil})

Figure S2

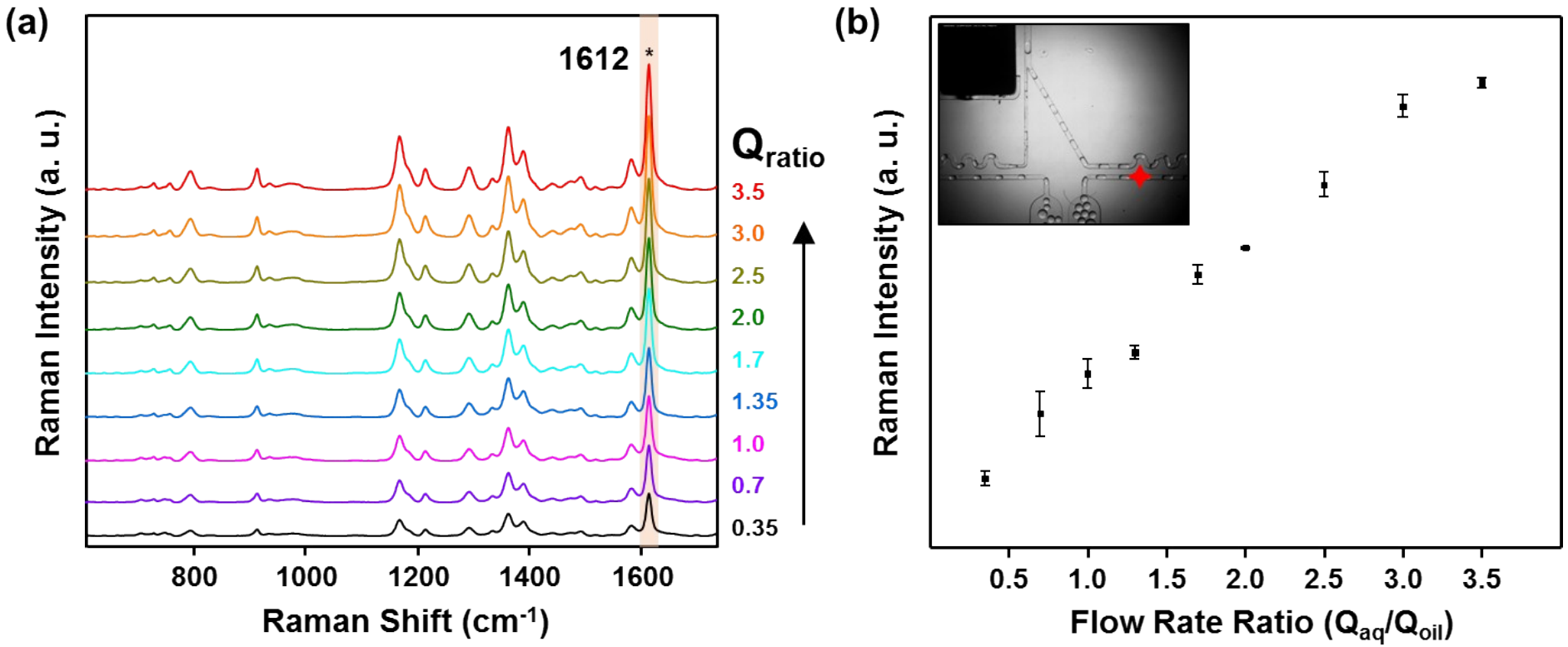

(a)
1612
*
Raman Intensity (a. u.)
Q ratio
3.5
3.0
2.5
2.0
1.7
1.35
1.0
0.7
0.35
800
1000
1200
1400
1600
Raman Shift (cm-1)
(b)
Raman Intensity (a. u.)
0.5
1.0
1.5
2.0
2.5
3.0
3.5
Flow Rate Ratio (Qaq/Qoil)

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