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## **Lab on Chip Supplemental Information**

## An automated programmable platform enabling multiplex dynamic stimuli delivery and cellular response monitoring for highthroughput single-cell signaling studies

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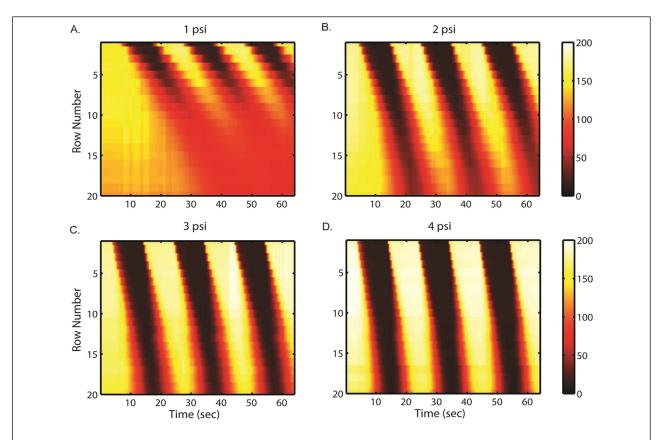
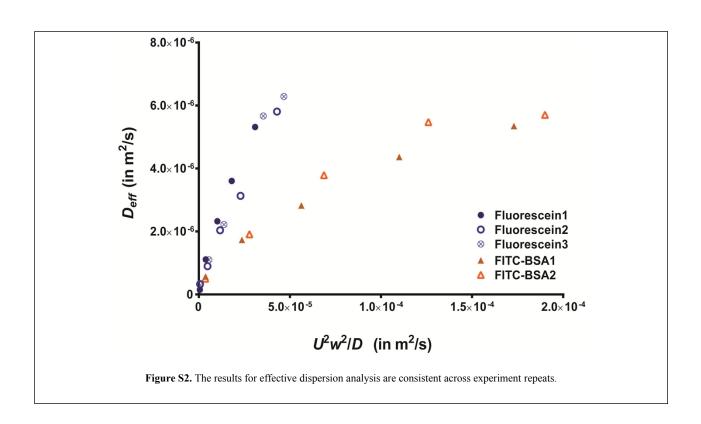
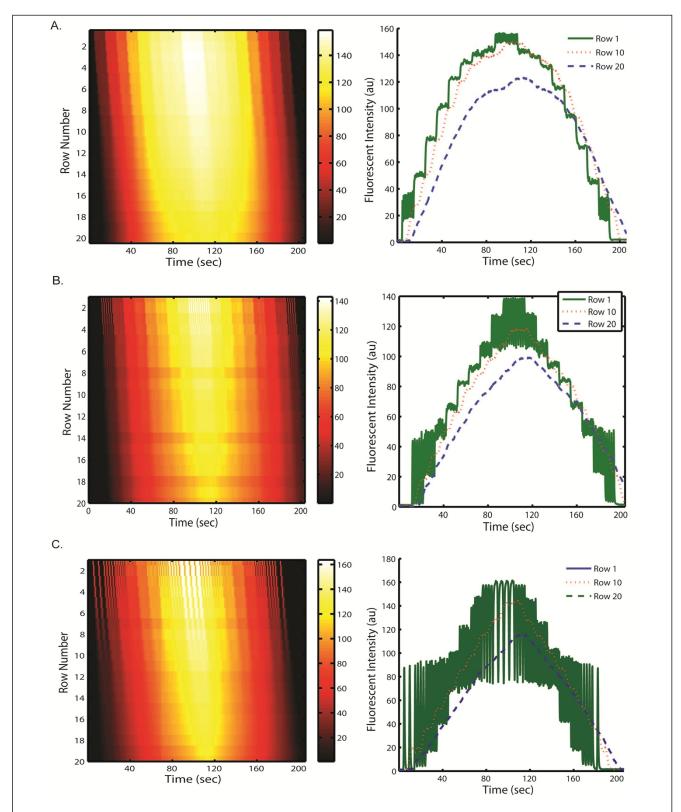


Figure S1. The stimulus profile visualized using FITC-BSA shows similar pattern to that of fluorescein, although FITC-BSA pattern are more dispersed compared to that of fluorescein. Profiles were generated by alternatively delivering FITC-BSA solution and PBS at 50 mHz driven by (A) 1psi, (B) 2psi, (C) 3psi and (D) 4psi. Heatmaps of spatial (Y axis) and temporal (X axis) show fluorescent intensity (color bar) in single observation chamber.

FITC-BSA dispersion										
Driving Pressure	Mean Flow Velocity	Effective Dispersion Coefficient		Rise Time t (sec) for Row #						
(PSI)	<b>U</b> (m/s)	<b>Deff</b> (m^2/s)	1	5	10	15	20			
1	5.14E-04	5.67E-07	1.7	7.8	19.4	24.5	28.6			
2	1.29E-03	1.73E-06	0.9	3.1	7.0	9.4	12.3			
3	1.98E-03	2.82E-06	0.7	2.0	4.4	6.1	8.2			
4	2.78E-03	4.36E-06	0.6	1.4	3.2	4.4	6.0			
5	3.48E-03	5.35E-06	0.5	1.2	2.6	3.6	4.8			

Fluorescein dispersion											
Driving Pressure	Mean Flow Velocity	Effective Dispersion Coefficient		Rise Time <b>t</b> (sec) for Row #							
(PSI)	<b>U</b> (m/s)	<b>Deff</b> (m^2/s)	1	5	10	15	20				
1	5.23E-04	1.47E-07	1.1	6.5	13.3	15.2	14.2				
2	1.34E-03	1.11E-06	0.6	2.7	6.0	7.9	9.4				
3	2.20E-03	2.32E-06	0.5	1.6	3.8	5.2	6.4				
4	2.92E-03	3.61E-06	0.4	1.3	3.0	4.1	5.1				
5	3.82E-03	5.32E-06	0.4	1.0	2.2	3.2	4.1				





**Figure S3.** The choice of base pulse duration affects stimulation profile. The spatial-temporal heat map of fluorescent intensity within an observation chamber and its corresponding fluorescent intensity profile: (A) FITC-BSA solution with base pulse of 100 ms, (B) fluorescein solution with base pulse of 200 ms, and (C) FITC-BSA solution with base base pulse of 500 ms.