Electronic Supplementary Material (ESI) for Sensors & Diagnostics.

Supplementary Document

Supplementary Table I: Calibration of PDMS chip without manifold

Sample	DI	Reagent	Reading 1	Reading 2	Reading 3	Average	Total Average	SD	AVG_SD
0	225	25	0.032	0.032	0.031	0.031667	0.03322	0.000577	0.00119
0	225	25	0.033	0.034	0.035	0.034		0.001	
0	225	25	0.032	0.034	0.036	0.034		0.002	
0.5	225	25	0.054	0.055	0.056	0.055	0.05378	0.001	0.00072
0.5	225	25	0.054	0.053	0.054	0.053667		0.000577	
0.5	225	25	0.052	0.053	0.053	0.052667		0.000577	
1	225	25	0.058	0.058	0.058	0.058	0.05811	0	0.00072
1	225	25	0.057	0.058	0.059	0.058		0.001	
1	225	25	0.059	0.057	0.059	0.058333		0.001155	
1.5	225	25	0.065	0.065	0.066	0.065333	0.06567	0.000577	0.00077
1.5	225	25	0.066	0.067	0.066	0.066333		0.000577	
1.5	225	25	0.064	0.066	0.066	0.065333		0.001155	
2	225	25	0.071	0.071	0.069	0.070333	0.06967	0.001155	0.00091
2	225	25	0.069	0.068	0.07	0.069		0.001	
2	225	25	0.07	0.069	0.07	0.069667		0.000577	

Supplementary Table II: Manual Calibration without manifold

Sample	DI	Reagent	Reading 1	Reading 2	Reading 3	Average	SD
0.5	225	25	0.047	0.047	0.045	0.046333	0.001155
1	225	25	0.053	0.054	0.053	0.053333	0.000577
1.5	225	25	0.054	0.055	0.056	0.055	0.001
2	225	25	0.059	0.061	0.061	0.060333	0.001155

Supplementary Table III : Calibration of PDMS chip with manifold

Sample	DI	Reagent	Reading 1	Reading 2	Reading 3	Average	Total average	SD	Total_SD
0	225	25	0.025	0.023	0.024	0.024	0.023556	0.001	0.002037
0	225	25	0.026	0.026	0.024	0.025333		0.001155	
0	225	25	0.022	0.021	0.021	0.021333		0.000577	
0.5	225	25	0.031	0.03	0.029	0.03	0.030111	0.001	0.000192
0.5	225	25	0.032	0.03	0.028	0.03		0.002	
0.5	225	25	0.03	0.031	0.03	0.030333		0.000577	
1	225	25	0.036	0.035	0.035	0.035333	0.034333	0.000577	0.001202
1	225	25	0.035	0.034	0.035	0.034667		0.000577	

1	225	25	0.034	0.033	0.032	0.033		0.001	
1.5	225	25	0.041	0.039	0.039	0.039667	0.039	0.001155	0.000667
1.5	225	25	0.04	0.039	0.038	0.039		0.001	
1.5	225	25	0.038	0.038	0.039	0.038333		0.000577	
2	225	25	0.045	0.044	0.045	0.044667	0.043667	0.000577	0.001453
2	225	25	0.043	0.046	0.044	0.044333		0.001528	
2	225	25	0.042	0.041	0.043	0.042		0.001	

Supplementary Table IV: Manual Calibration with manifold

Sample	DI	Reagent	Reading 1	Reading 2	Reading 3	AVG	SD
2	225	25	0.042	0.043	0.042	0.042333	0.000577
1.5	225	25	0.039	0.038	0.039	0.038667	0.000577
1	225	25	0.035	0.035	0.037	0.035667	0.001155
0.5	225	25	0.031	0.032	0.032	0.031667	0.000577
0	225	25	0.021	0.02	0.022	0.021	0.001

Supplementary Table V: On chip Detection with Spectrometer (Ocean View)

Concentration	Absorbance 1	Absorbance 2	Average absorbance	SD
0	0.07	0.09	0.08	0.014142
1.62	0.13	0.14	0.135	0.007071
3.25	0.18	0.18	0.18	0
4.87	0.18	0.19	0.185	0.007071
6.5	0.22	0.23	0.225	0.007071

Supplementary Table VI: On chip Detection with Smartphone

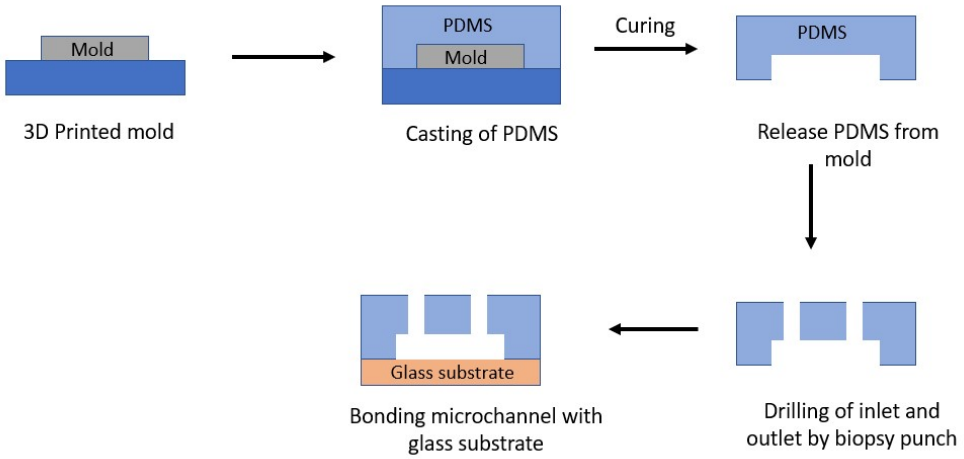
Concentration	R1	R1	R2	Abs1	Abs 2	Abs 3	average	SD
0	61	62	61	0	0	0	0	0
1.62	60	60	58	0.007179	0.01424	0.021902	0.01444	0.006012
3.25	51	54	54	0.07776	0.059998	0.052936	0.063565	0.010443
4.87	50	43	40	0.08636	0.158923	0.18327	0.142851	0.041163
6.5	40	40	43	0.18327	0.190332	0.151861	0.175154	0.016721

Supplementary Table VII: Limit of detection calculation

Chip Condition	STD	Slope	LOD(mg/dL)	Range
Off chip (without manifold)	0.000192	0.0028	0.2057143	1.62-6.5 mg/dL

Off chip (with manifold)	0.00072	0.0023	0.9391304	2.39-9.59mg/dL
On chip (portable)	0.00707	0.0169	1.2550296	1.62-6.5 mg/dL
On chip (smart phone camera)	0.006012	0.0345	0.5227826	1.62-6.5 mg/dL

Supplementary Figure 1: Fabrication of the PDMS chip



Supplementary Figure 1. Overview of the chip fabrication process. The design of the chip is transferred from a SLA printed 3D mold to PDMS and channels are created by bonding with a glass substrate by air plasma.