

*Supplementary Information*

**Colorimetric Enzyme-Linked Immunosorbent Assay (ELISA) Detection Platform for Point-of-Care Dengue Detection System on Lab-on-Compact-Disc. *Sensors* 2015, 15, 11431-11441**

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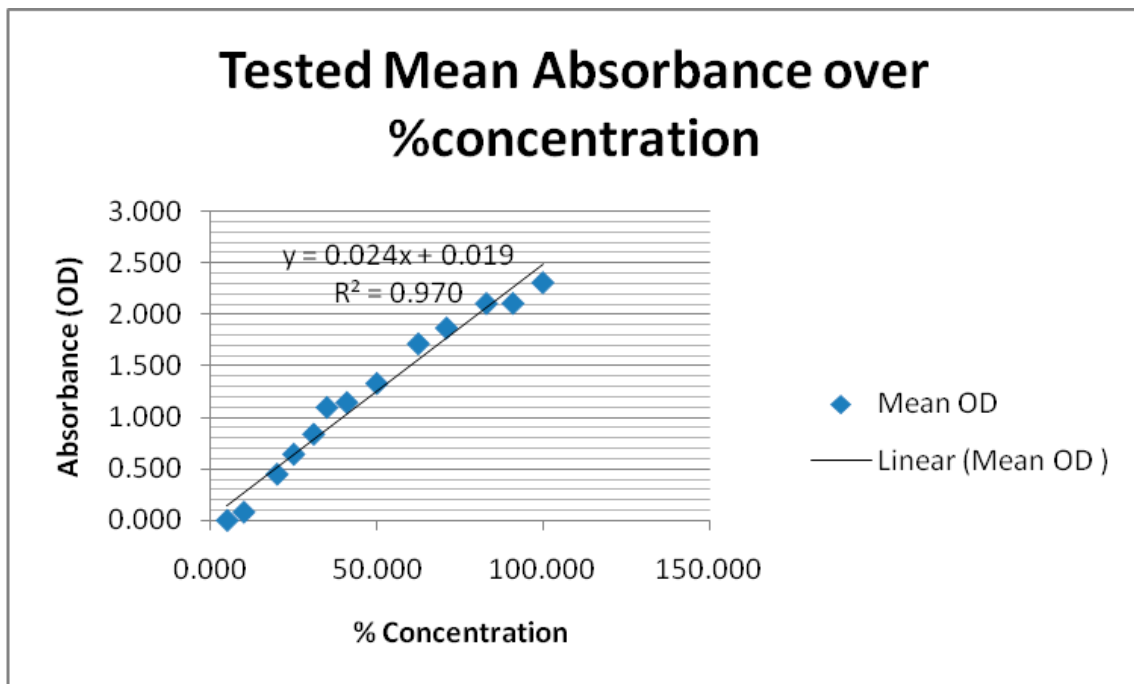
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## 1. Sensor Response to Concentration

**Table S1.** Absorbance values over different concentrations.

	OD Trial 1	OD Trial 2	Mean OD	Estimated OD	Error	Accuracy (%)	Concentration	% Concentration
1	2.297	2.321	2.309	2.309	0.000	0.000	1.000	100.000
2	2.095	2.120	2.108	2.101	-0.006	-0.300	0.910	91.000
3	2.102	2.109	2.106	1.916	-0.189	-9.863	0.830	83.000
4	1.868	1.869	1.869	1.639	-0.229	-13.975	0.710	71.000
5	1.710	1.719	1.715	1.443	-0.271	-18.805	0.625	62.500
6	1.323	1.337	1.330	1.155	-0.176	-15.201	0.500	50.000
7	1.139	1.149	1.144	0.947	-0.197	-20.842	0.410	41.000
8	1.094	1.100	1.097	0.808	-0.289	-35.742	0.350	35.000
9	0.843	0.831	0.837	0.716	-0.121	-16.934	0.310	31.000
10	0.613	0.672	0.643	0.577	-0.065	-11.304	0.250	25.000
11	0.430	0.467	0.449	0.462	0.013	2.880	0.200	20.000
12	0.053	0.107	0.080	0.231	0.151	65.353	0.100	10.000
13	0.000	0.000	0.000	0.115	0.115	100.000	0.050	5.000



**Figure S1.** Recorded absorbance (OD) over per cent concentration of sample to calibrate sensor response.

## 2. Clinical Trial Results

**Table S2.** Clinical trial results.

Sample	Microplate Reader	LOCD Reader	Microplate Reader	LOCD Reader	Remark
1	2.397	3.156	+	+	+Control
2	1.999	2.795	+	+	+Control
3	0.049	0.000	-	-	-Control
4	0.052	0.000	-	-	-Control
5	0.056	0.000	-	-	
6	0.071	0.000	-	-	
7	0.613	0.430	+	+	
8	0.091	0.000	-	-	
9	0.062	0.000	-	-	
10	0.205	0.000	-	-	
11	0.075	0.000	-	-	
12	0.060	0.000	-	-	
13	0.066	0.000	-	-	
14	0.070	0.000	-	-	
15	1.838	2.561	+	+	
16	1.169	1.498	+	+	
17	0.088	0.000	-	-	
18	0.034	0.000	-	-	
19	0.695	0.589	+	+	
20	0.061	0.000	-	-	
21	2.987	3.665	+	+	
22	2.946	3.589	+	+	
23	0.173	0.000	-	-	
24	0.193	0.000	-	-	
25	0.219	0.000	-	-	
26	0.213	0.001	-	-	
27	0.216	0.008	-	-	
28	0.249	0.001	-	-	
29	0.358	0.001	-	-	
30	0.135	0.001	-	-	
31	0.252	0.001	-	-	
32	0.211	0.001	-	-	
33	0.406	0.001	-	-	
34	0.222	0.001	-	-	
35	0.272	0.001	-	-	
36	0.221	0.259	-	-	
37	0.360	0.240	-	-	
38	0.313	0.167	-	-	
39	0.233	0.000	-	-	
40	0.522	0.357	+	+	
41	2.601	2.774	+	+	
42	2.267	2.002	+	+	

**Table S2. Cont.**

<b>43</b>	0.059	0.000	–	–
<b>44</b>	0.055	0.000	–	–
<b>45</b>	0.058	0.000	–	–
<b>46</b>	0.212	0.001	–	–
<b>47</b>	0.191	0.000	–	–
<b>48</b>	0.087	0.000	–	–
<b>49</b>	0.086	0.000	–	–
<b>50</b>	1.906	2.199	+	+
<b>51</b>	0.868	0.789	+	+
<b>52</b>	2.598	3.179	+	+
<b>53</b>	0.069	0.000	–	–
<b>54</b>	0.708	0.420	+	+
<b>55</b>	0.591	0.450	+	+
<b>56</b>	0.084	0.000	–	–
<b>57</b>	0.168	0.000	–	–
<b>58</b>	0.124	0.000	–	–
<b>59</b>	1.849	2.265	+	+
<b>60</b>	0.657	0.345	+	+
<b>61</b>	0.172	0.000	–	–
<b>62</b>	0.105	0.000	–	–
<b>63</b>	0.541	0.360	+	+
<b>64</b>	0.520	0.195	+	–
<b>65</b>	0.213	0.149	–	–
<b>66</b>	0.582	0.430	+	+
<b>67</b>	0.193	0.000	–	–
<b>68</b>	0.612	0.554	+	+

3. Statistical Analysis Results in Analyze-It Software

Table S3. Regression line characteristics.

	Bias	95% CI	SE	p
<b>Constant</b>	-0.2	-0.25 to -0.15	0.027	<0.0001
<b>Proportional</b>	1.27	1.21 to 1.32	0.027	<0.0001
<b>Range</b>	0.034 to 0.9870			
<b>r</b>	0.985			
<b>Sy x</b>	0.1765			

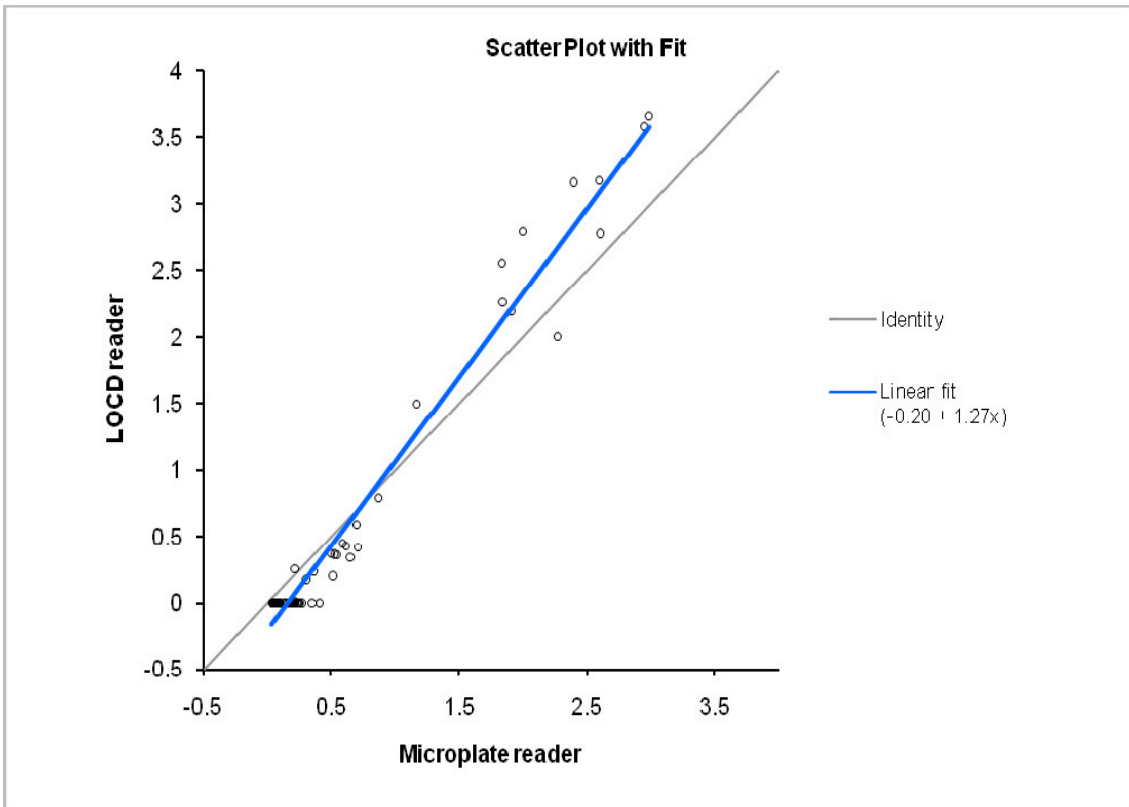


Figure S2. Correlation and linearity of the result.

Table S4. Results of LOCD reader device compared to a microplate reader.

	Microplate Reader			
	Dengue +	Dengue -	Total	
LOCD reader	Dengue +	20	0	20
	Dengue -	1	43	44
	Total	21	43	64

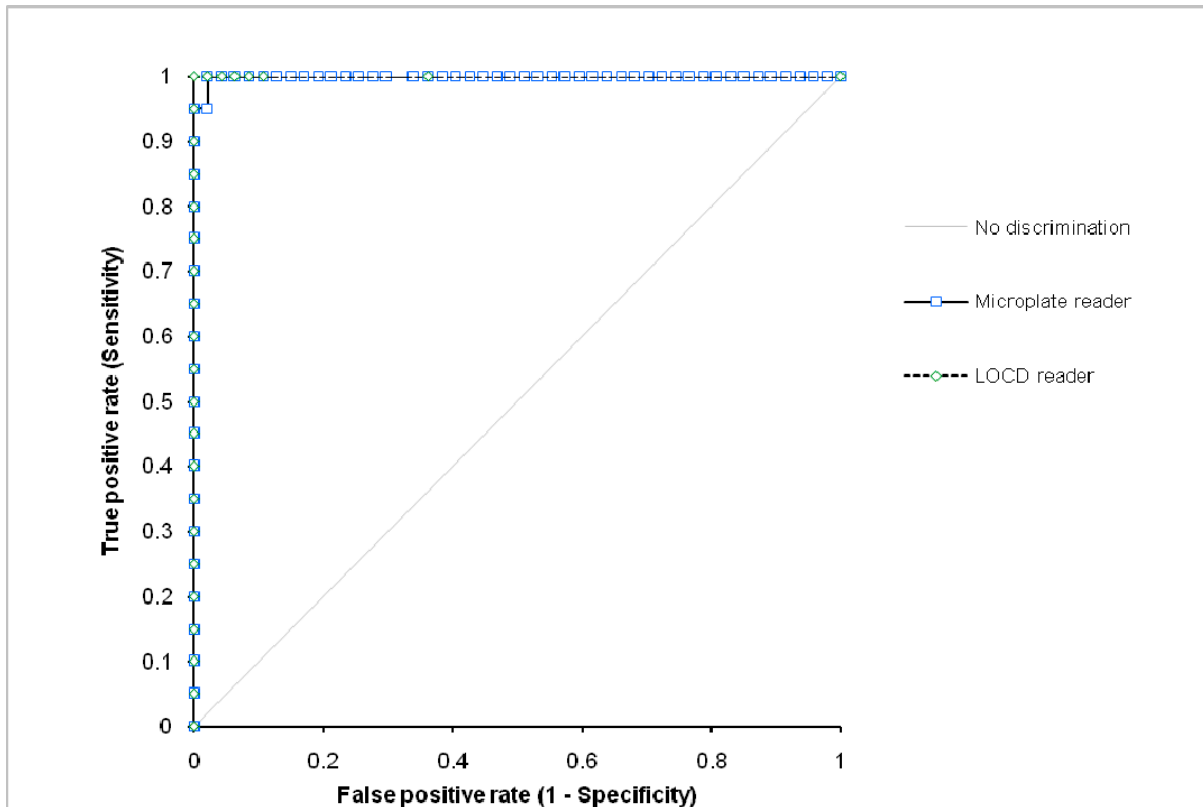
**Table S5.** LOCD reader qualitative statistical analysis outcome.

LOCD Reader	Outcomes	95% CI
Sensitivity—TP proportion	0.952	0.762 to 0.999
Specificity—TN proportion	1	0.918 to 1.000
FP proportion	0	0 to 0.082
FN proportion	0.048	0.001 to 0.238
Likelihood ratio (+)	$+\infty$	
Likelihood ratio (-)	0.05	

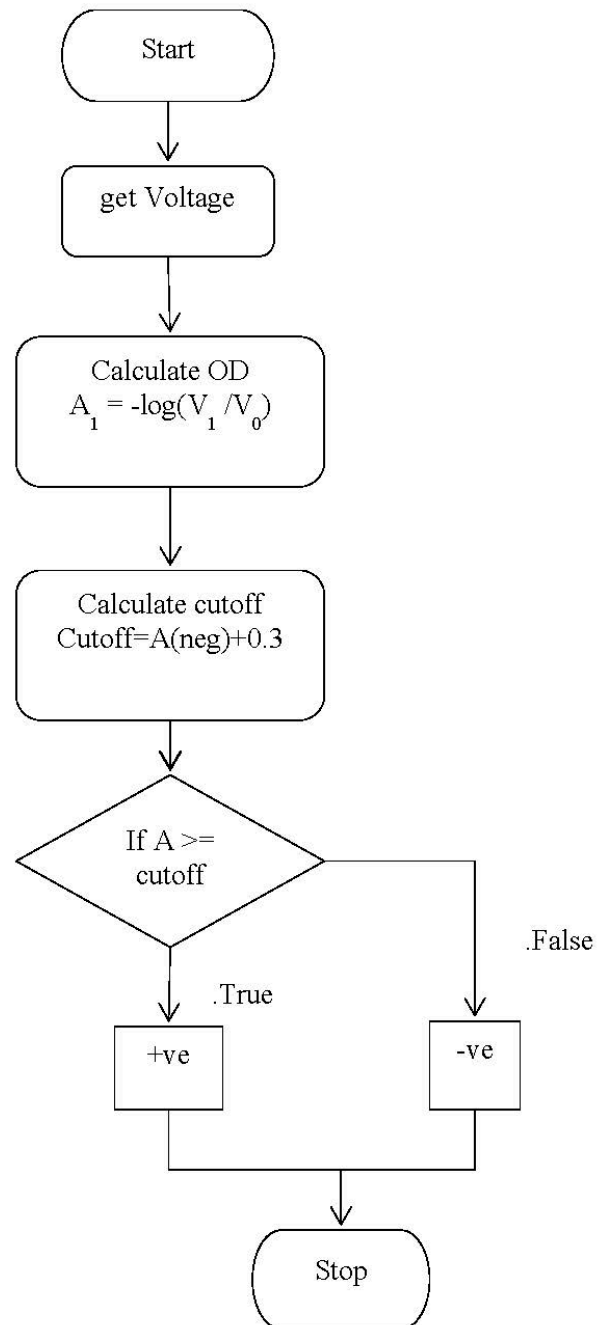
(TP = true positive, TN = true negative, FP = false positive, FN = false negative).

**Table S6.** Receiver Operating Characteristic (ROC) analyses of the result.

Test	Area	95% CI	SE	Dengue = +	
Microplate reader	1	1 to 1.00	0.002	have higher values	
LOCD reader	1	1 to 1.00	0	have higher values	
Contrast	Difference	95% CI	SE	Z	p
Microplate reader v LOCD reader	0	0 to 0.00	0.002	-0.71	0.4795

**Figure S3.** ROC curves of LOCD and Microplate reader results from sample of n = 64.

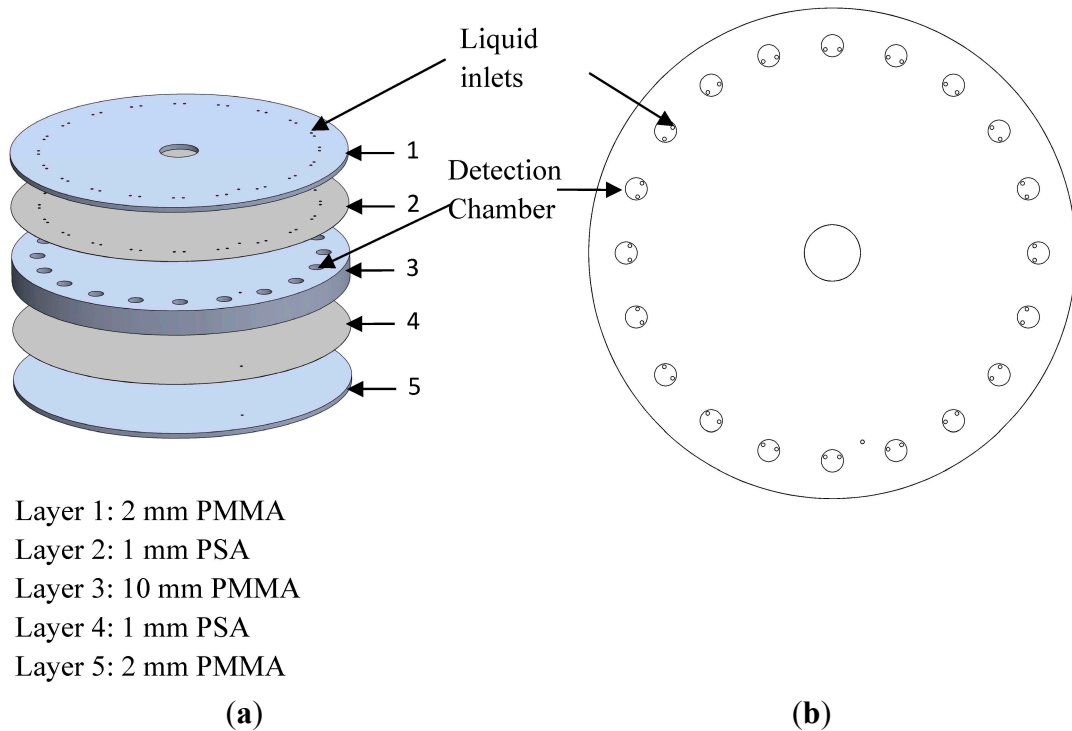
#### 4. Flowchart to Evaluate Clinical Diagnostic Results



**Figure S4.** Flowchart to evaluate clinical diagnostic results.

### 5. Design and Construction of the CD for Evaluation of the Constructed Sensor

CD is constructed from three layers of PMMA bonded by two Pressure Sensitive Adhesive (PSA) layers. The CD is designed in computer aided drawing and cut by a CNC machine. The layers are bonded by applying a pressure activated PSA. The device has 20 chambers which have the same dimensions as the wells in a microtiter plate. The CD has a diameter of 130 mm and overall height of 16 mm. This CD is specifically designed for evaluation of the sensor.



**Figure S5.** (a) Exploded view of Lab-on Compact Disc (LOCD) for evaluation of the sensor; (b) 2D top view of CD.



6. Circuit Diagram of the Detection System for ELISA on LOCD

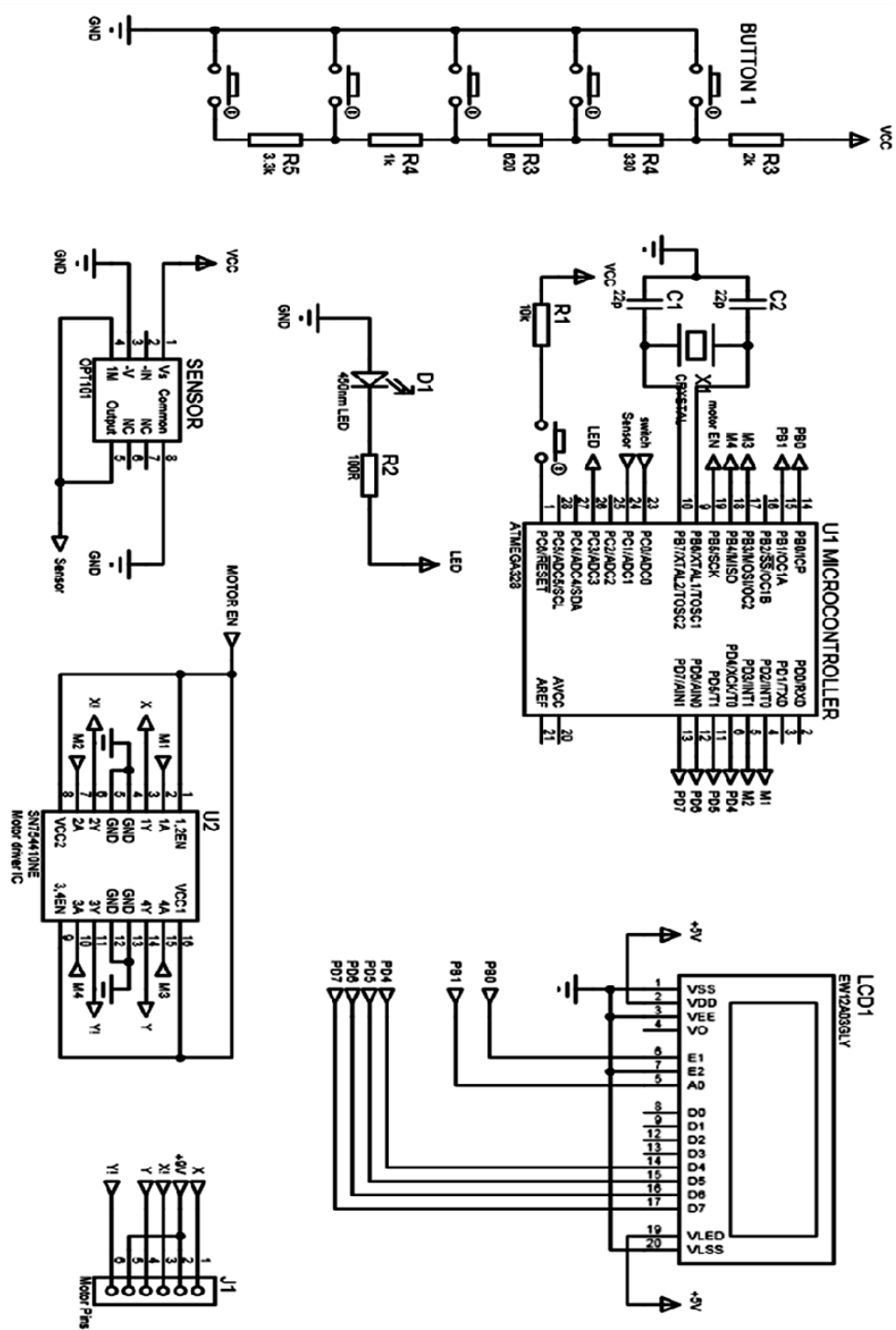


Figure S6. Circuit diagram of the detection system for ELISA on LOCD.

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