

Background

All of the 2017 iGEM teams are invited and encouraged to participate in the Fourth International InterLaboratory Measurement Study in synthetic biology. We're hoping this study will get you excited for iGEM and help prepare you for the summer!

Design

GFP is one of the most used markers in synthetic biology. It gives researchers an access to continuously monitoring the expression level of specific plasmid. However, due to variation in unit, method of data processing, protocol, or instrument, it is hard to repeat measurement in different labs. To solve the problem, we enter interlab study to finish the program by quantifying the experiment with the same protocol.

We use FITC to construct standard measurement curve. Using eight devices from kit plate we get fluorescence curve of them. By comparing those data with blank control, we can find out the expression level of each part.

During Interlab Study, we keep setting of plate reader the same to narrow the variation. Due to lack of black wells with clear bottom, we use black wells with black bottom in fluorescence measurement and clear wells with clear bottom in Abs measurement.

Material

Plasmid used:

- Positive Control (BBa_I20270): (well 20B, Kit Plate 6 and well 21B, Kit Plate 7)
- Negative Control (BBa_R0040): (well 20D, Kit Plate 6 and well 21D, Kit Plate 7)
- Test Device 1 (BBa_J364000): (well 20F, Kit Plate 6 and well 21F, Kit Plate 7)
- Test Device 2 (BBa_J364001): (well 20H, Kit Plate 6 and well 21H, Kit Plate 7)
- Test Device 3 (BBa_J364002): (well 20J, Kit Plate 6 and well 21J, Kit Plate 7)
- Test Device 4 (BBa_J364003): (well 20L, Kit Plate 6 and well 21L, Kit Plate 7)
- Test Device 5 (BBa_J364004): (well 20N, Kit Plate 6 and well 21N, Kit Plate 7)
- Test Device 6 (BBa_J364005): (well 20P, Kit Plate 6 and well 21P, Kit Plate 7)

Protocols

>>[Calibration](#)

>>[Cell measurement](#)

Description

Positive control, negative control and devices 2~6 are all taken up from 2017 DNA distribution kit plate 7 and device1 is taken from plate 6 because we failed to transform it using plasmids in plate 7. After checking the results under UV light, we chose 2 colonies for each device and grew them in 5ml LB for 16h. Then OD was measured and recorded in order to calculate the volume of bacteria liquid to be added to make the final OD around 0.02 before the following incubation.

We incubated the DH5 α for 6 hours, and we took 100 μ l bacteria liquid for measurement every other hour. OD and fluorescence were both measured by Tecan Genios. However, the measurement of OD used clear plate while the measurement of fluorescence used black plate. This is because we were not able to get the black clear plate. And we are trying to connect HQ to express this problem.

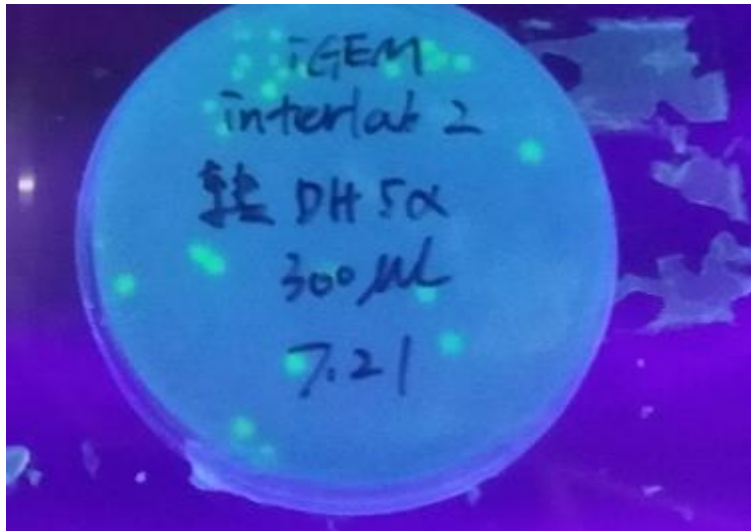


Figure 1. result of device2 after transformation

Results

Data

OD699 Reference Point

Table 1.OD600 Reference Point

-

FITC standard curve

Table 2. Data of FITC standard curve

-

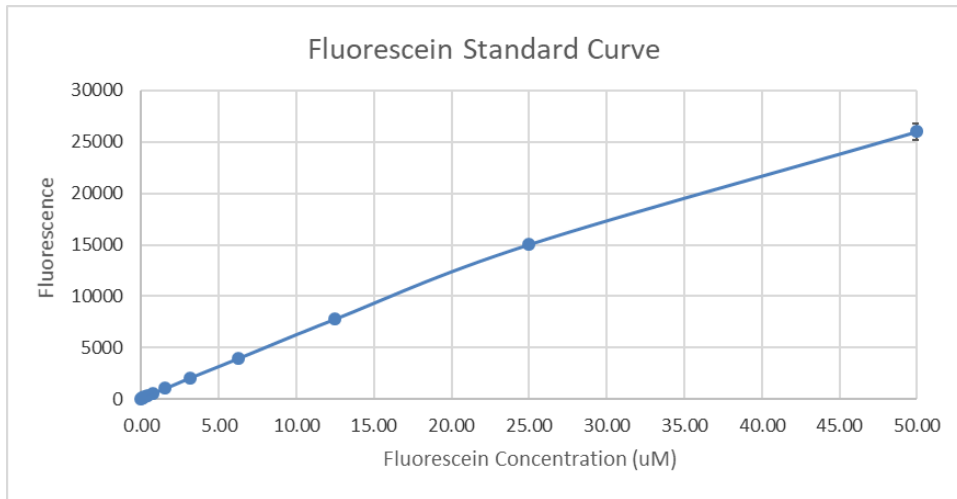


Figure 2. FITC standard curve

Normalization

Table 3. Normalization

Cell Measurement

Table 4. Raw data of Abs600 measurement

Abs600 Raw Readings:									
Hour 0:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	0.1589	0.1654	0.0986	0.1498	0.1519	0.0692	0.1423	0.0789	0.0522
Colony 1, Replicate 2	0.1489	0.1684	0.1086	0.1575	0.1499	0.0652	0.1666	0.0799	0.0529
Colony 1, Replicate 3	0.1589	0.172	0.1006	0.1564	0.1598	0.0641	0.1517	0.0765	0.0514
Colony 1, Replicate 4	0.1762	0.1694	0.0882	0.1683	0.1692	0.068	0.1675	0.0645	0.0513
Colony 2, Replicate 1	0.1617	0.1601	0.058	0.136	0.1464	0.0672	0.1339	0.0863	0.0502
Colony 2, Replicate 2	0.1733	0.168	0.0578	0.1391	0.165	0.0691	0.1504	0.0922	0.0507
Colony 2, Replicate 3	0.1748	0.1728	0.0597	0.1348	0.1708	0.0731	0.1643	0.0833	0.0505
Colony 2, Replicate 4	0.1888	0.1681	0.0554	0.1443	0.1788	0.069	0.1739	0.0652	0.0527
Hour 2:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	0.174	0.1716	0.1542	0.1986	0.1993	0.0962	0.167	0.1149	0.0527
Colony 1, Replicate 2	0.2059	0.2186	0.1616	0.1959	0.1913	0.094	0.1924	0.1378	0.0536
Colony 1, Replicate 3	0.1472	0.1924	0.1552	0.1965	0.1885	0.099	0.1748	0.1283	0.0548
Colony 1, Replicate 4	0.2086	0.1768	0.1497	0.2134	0.1539	0.0302	0.2046	0.1169	0.0534
Colony 2, Replicate 1	0.1952	0.1779	0.063	0.1938	0.1809	0.1056	0.198	0.1766	0.0556
Colony 2, Replicate 2	0.2065	0.2024	0.0664	0.2042	0.2071	0.1153	0.2055	0.1712	0.0587
Colony 2, Replicate 3	0.1923	0.2038	0.0616	0.2076	0.2185	0.1204	0.2064	0.1778	0.0562
Colony 2, Replicate 4	0.1896	0.1969	0.0651	0.2107	0.2261	0.1163	0.2098	0.1628	0.0559
Hour 4:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	0.3349	0.3145	0.242	0.3319	0.3337	0.1831	0.3132	0.2357	0.0534
Colony 1, Replicate 2	0.3128	0.3291	0.2629	0.3366	0.3288	0.2024	0.2624	0.2562	0.0562
Colony 1, Replicate 3	0.314	0.344	0.226	0.3459	0.3028	0.1805	0.3405	0.2588	0.0556
Colony 1, Replicate 4	0.3229	0.322	0.219	0.2743	0.2383	0.1875	0.3182	0.2383	0.0515
Colony 2, Replicate 1	0.338	0.3488	0.0759	0.3215	0.3306	0.1906	0.2255	0.3014	0.0509
Colony 2, Replicate 2	0.3192	0.3532	0.0818	0.3238	0.3469	0.19	0.0719	0.2718	0.0545
Colony 2, Replicate 3	0.3592	0.3654	0.0785	0.3243	0.3543	0.2069	0.2091	0.2852	0.0518
Colony 2, Replicate 4	0.3476	0.3497	0.0794	0.2586	0.35	0.1989	0.2162	0.2881	0.0509
Hour 6:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	0.4968	0.4892	0.3917	0.503	0.508	0.3381	0.4975	0.4033	0.0518
Colony 1, Replicate 2	0.4867	0.48	0.4158	0.494	0.5356	0.3424	0.5067	0.2278	0.0515
Colony 1, Replicate 3	0.4832	0.5122	0.4008	0.4865	0.5467	0.3543	0.5103	0.4029	0.0501
Colony 1, Replicate 4	0.5019	0.5464	0.4176	0.5013	0.5685	0.2645	0.4971	0.4522	0.0522
Colony 2, Replicate 1	0.5719	0.5476	0.1237	0.521	0.505	0.3338	0.4814	0.4618	0.0509
Colony 2, Replicate 2	0.5721	0.5564	0.1178	0.53	0.5114	0.3515	0.5171	0.4708	0.0503
Colony 2, Replicate 3	0.5676	0.5587	0.1425	0.4921	0.5389	0.358	0.5275	0.4807	0.0545
Colony 2, Replicate 4	0.5741	0.5459	0.1404	0.5364	0.5198	0.3489	0.5204	0.4771	0.0509

Table 5. Blank subtraction and correction of Abs600 measurement.

Abs600 Raw Readings:									
Hour 0:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	
Colony 1, Replicate 1	0.1067	0.1132	0.0464	0.0976	0.0997	0.017	0.0901	0.0267	
Colony 1, Replicate 2	0.096	0.1155	0.0557	0.1046	0.097	0.0123	0.1137	0.027	
Colony 1, Replicate 3	0.1075	0.1206	0.0492	0.105	0.1084	0.0127	0.1003	0.0251	
Colony 1, Replicate 4	0.1249	0.1181	0.0369	0.117	0.1179	0.0167	0.1162	0.0132	
Colony 2, Replicate 1	0.1115	0.1099	0.0078	0.0858	0.0962	0.017	0.0837	0.0361	
Colony 2, Replicate 2	0.1226	0.1173	0.0071	0.0884	0.1143	0.0184	0.0997	0.0415	
Colony 2, Replicate 3	0.1243	0.1223	0.0092	0.0843	0.1203	0.0226	0.1138	0.0328	
Colony 2, Replicate 4	0.1361	0.1154	0.0027	0.0916	0.1261	0.0163	0.1212	0.0125	
Hour 2:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	
Colony 1, Replicate 1	0.1213	0.1189	0.1015	0.1459	0.1466	0.0435	0.1143	0.0622	
Colony 1, Replicate 2	0.1523	0.165	0.108	0.1423	0.1377	0.0404	0.1388	0.0842	
Colony 1, Replicate 3	0.0924	0.1376	0.1004	0.1417	0.1337	0.0442	0.12	0.0735	
Colony 1, Replicate 4	0.1552	0.1234	0.0963	0.16	0.1005	-0.0232	0.1512	0.0635	
Colony 2, Replicate 1	0.1396	0.1223	0.0074	0.1382	0.1253	0.05	0.1424	0.121	
Colony 2, Replicate 2	0.1478	0.1437	0.0077	0.1455	0.1484	0.0566	0.1468	0.1125	
Colony 2, Replicate 3	0.1361	0.1476	0.0054	0.1514	0.1623	0.0642	0.1502	0.1216	
Colony 2, Replicate 4	0.1337	0.141	0.0092	0.1548	0.1702	0.0604	0.1539	0.1069	
Hour 4:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	
Colony 1, Replicate 1	0.2815	0.2611	0.1886	0.2785	0.2803	0.1297	0.2598	0.1823	
Colony 1, Replicate 2	0.2566	0.2729	0.2067	0.2804	0.2726	0.1462	0.2062	0.2	
Colony 1, Replicate 3	0.2584	0.2884	0.1704	0.2903	0.2472	0.1249	0.2849	0.2032	
Colony 1, Replicate 4	0.2714	0.2705	0.1675	0.2228	0.1868	0.136	0.2667	0.1868	
Colony 2, Replicate 1	0.2871	0.2979	0.025	0.2706	0.2797	0.1397	0.1746	0.2505	
Colony 2, Replicate 2	0.2647	0.2987	0.0273	0.2693	0.2924	0.1355	0.0174	0.2173	
Colony 2, Replicate 3	0.3074	0.3136	0.0267	0.2725	0.3025	0.1551	0.1573	0.2334	
Colony 2, Replicate 4	0.2967	0.2988	0.0285	0.2077	0.2991	0.148	0.1653	0.2372	
Hour 6:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	
Colony 1, Replicate 1	0.445	0.4374	0.3399	0.4512	0.4562	0.2863	0.4457	0.3515	
Colony 1, Replicate 2	0.4352	0.4285	0.3643	0.4425	0.4841	0.2909	0.4552	0.1763	
Colony 1, Replicate 3	0.4331	0.4621	0.3507	0.4364	0.4966	0.3042	0.4602	0.3528	
Colony 1, Replicate 4	0.4497	0.4942	0.3654	0.4491	0.5163	0.2123	0.4449	0.4	
Colony 2, Replicate 1	0.521	0.4967	0.0728	0.4701	0.4541	0.2829	0.4305	0.4109	
Colony 2, Replicate 2	0.5218	0.5061	0.0675	0.4797	0.4611	0.3012	0.4668	0.4205	
Colony 2, Replicate 3	0.5131	0.5042	0.088	0.4376	0.4844	0.3035	0.473	0.4262	
Colony 2, Replicate 4	0.5232	0.495	0.0895	0.4855	0.4689	0.298	0.4695	0.4262	

Average

	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Hour 0:								
Colony 1	0.108775	0.11685	0.04705	0.10605	0.10575	0.014675	0.105075	0.023
Colony 2	0.123625	0.116225	0.0067	0.087525	0.114225	0.018575	0.1046	0.030725
Hour 2:								
Colony 1	0.1303	0.136225	0.10155	0.147475	0.129625	0.026225	0.131075	0.07085
Colony 2	0.1393	0.13865	0.007425	0.147475	0.15155	0.0578	0.148325	0.1155
Hour 4:								
Colony 1	0.266975	0.273225	0.1833	0.268	0.246725	0.1342	0.2544	0.193075
Colony 2	0.288975	0.30225	0.026875	0.255025	0.293425	0.144575	0.12865	0.2346
Hour 6:								
Colony 1	0.44075	0.45555	0.355075	0.4448	0.4883	0.273425	0.4515	0.32015
Colony 2	0.519775	0.5005	0.07945	0.468225	0.467125	0.2964	0.45995	0.42095

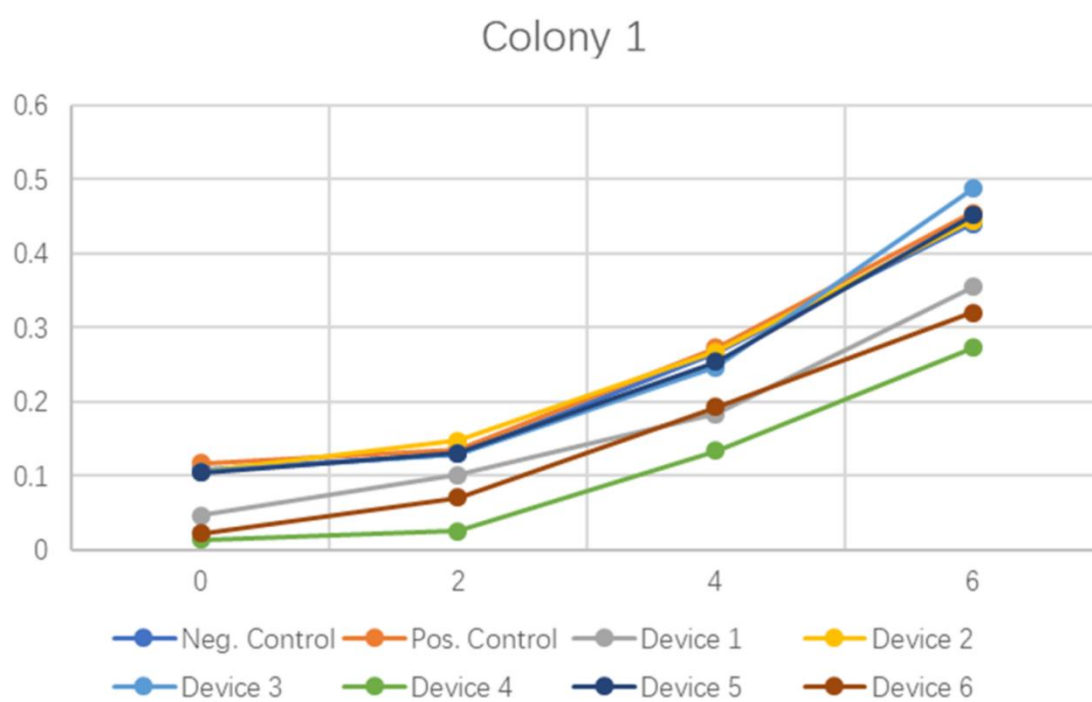


Figure 3. Blank subtraction and correction of Colony 1 Abs600 measurement.

Colony 2

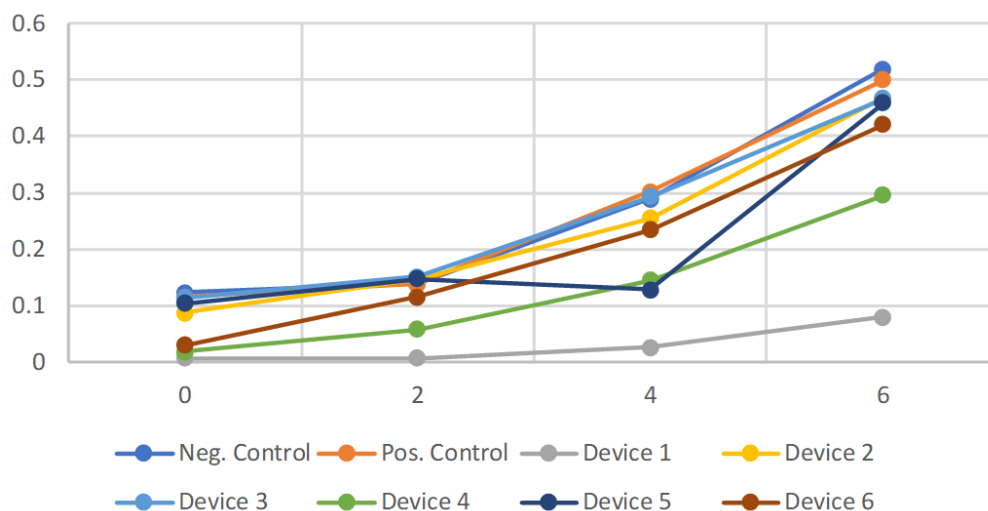


Figure 4. Blank subtraction and correction of Colony 2 Abs600 measurement.

Table 6. Raw data of fluorescence measurement.

Fluorescence Raw Readings:									
Hour 0:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	159	200	243	240	168	166	191	149	147
Colony 1, Replicate 2	144	182	251	242	162	148	188	163	149
Colony 1, Replicate 3	152	177	240	243	174	174	203	171	157
Colony 1, Replicate 4	156	191	231	244	156	175	203	86	262
Colony 2, Replicate 1	162	185	201	229	170	171	179	159	147
Colony 2, Replicate 2	159	178	204	220	172	173	180	169	155
Colony 2, Replicate 3	162	191	215	205	169	179	186	152	150
Colony 2, Replicate 4	163	193	158	244	188	183	196	148	164
Hour 2:									
Hour 2:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	183	180	304	254	175	214	213	172	165
Colony 1, Replicate 2	177	220	304	245	176	201	187	164	149
Colony 1, Replicate 3	171	231	314	240	185	207	197	175	155
Colony 1, Replicate 4	162	216	354	257	334	88	190	166	154
Colony 2, Replicate 1	174	202	211	248	176	196	210	157	160
Colony 2, Replicate 2	171	211	204	252	180	195	211	172	152
Colony 2, Replicate 3	180	209	198	262	167	195	209	158	158
Colony 2, Replicate 4	167	223	218	281	193	204	202	160	157
Hour 4:									
Hour 4:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	202	290	505	361	196	237	240	172	166
Colony 1, Replicate 2	199	288	509	340	193	234	232	172	157
Colony 1, Replicate 3	197	294	508	359	201	220	234	180	164
Colony 1, Replicate 4	197	292	494	294	148	209	236	173	157
Colony 2, Replicate 1	203	272	221	349	193	252	192	176	157
Colony 2, Replicate 2	203	286	221	349	190	224	86	184	158
Colony 2, Replicate 3	204	274	223	359	199	248	225	194	161
Colony 2, Replicate 4	208	296	231	321	201	250	77	187	160
Hour 6:									
Hour 6:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6	LB + Chlor (blank)
Colony 1, Replicate 1	228	427	1046	646	251	342	337	200	171
Colony 1, Replicate 2	226	421	1042	634	240	343	328	134	162
Colony 1, Replicate 3	238	420	1029	623	246	338	337	192	163
Colony 1, Replicate 4	237	426	1031	623	247	299	327	202	154
Colony 2, Replicate 1	253	411	253	643	241	350	344	209	162
Colony 2, Replicate 2	246	427	264	655	233	352	343	216	167
Colony 2, Replicate 3	248	422	251	670	245	348	343	208	161
Colony 2, Replicate 4	246	426	255	663	248	362	352	210	164

Table 7. Blank subtraction and correction of fluorescence measurement.

Fluorescence Raw Readings:								
Hour 0:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Colony 1, Replicate 1	12	53	96	93	21	19	44	2
Colony 1, Replicate 2	-5	33	102	93	13	-1	39	14
Colony 1, Replicate 3	-5	20	83	86	17	17	46	14
Colony 1, Replicate 4	-106	-71	-31	-18	-106	-87	-59	-176
Colony 2, Replicate 1	15	38	54	82	23	24	32	12
Colony 2, Replicate 2	4	23	49	65	17	18	25	14
Colony 2, Replicate 3	12	41	65	55	19	29	36	2
Colony 2, Replicate 4	-1	29	-6	80	24	19	32	-16
Hour 2:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Colony 1, Replicate 1	18	15	139	89	10	49	48	7
Colony 1, Replicate 2	28	71	155	96	27	52	38	15
Colony 1, Replicate 3	16	76	159	85	30	52	42	20
Colony 1, Replicate 4	8	62	200	103	180	-66	36	12
Colony 2, Replicate 1	14	42	51	88	16	36	50	-3
Colony 2, Replicate 2	19	59	52	100	28	43	59	20
Colony 2, Replicate 3	22	51	40	104	9	37	51	0
Colony 2, Replicate 4	10	66	61	124	36	47	45	3
Hour 4:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Colony 1, Replicate 1	36	124	339	195	30	71	74	6
Colony 1, Replicate 2	42	131	352	183	36	77	75	15
Colony 1, Replicate 3	33	130	344	195	37	56	70	16
Colony 1, Replicate 4	40	135	337	137	-9	52	79	16
Colony 2, Replicate 1	46	115	64	192	36	95	35	19
Colony 2, Replicate 2	45	128	63	191	32	66	-72	26
Colony 2, Replicate 3	43	113	62	198	38	87	64	33
Colony 2, Replicate 4	48	136	71	161	41	90	-83	27
Hour 6:	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Colony 1, Replicate 1	57	256	875	475	80	171	166	29
Colony 1, Replicate 2	64	259	880	472	78	181	166	-28
Colony 1, Replicate 3	75	257	866	460	83	175	174	29
Colony 1, Replicate 4	83	272	877	469	93	145	173	48
Colony 2, Replicate 1	91	249	91	481	79	188	182	47
Colony 2, Replicate 2	79	260	97	488	66	185	176	49
Colony 2, Replicate 3	87	261	90	509	84	187	182	47
Colony 2, Replicate 4	82	262	91	499	84	198	188	46

Average

	Neg. Control	Pos. Control	Device 1	Device 2	Device 3	Device 4	Device 5	Device 6
Hour 0:								
Colony 1	-26	8.75	62.5	63.5	-13.75	-13	17.5	-36.5
Colony 2	7.5	32.75	40.5	70.5	20.75	22.5	31.25	3
Hour 2:								
Colony 1	17.5	56	163.25	93.25	61.75	21.75	41	13.5
Colony 2	16.25	54.5	51	104	22.25	40.75	51.25	5
Hour 4:								
Colony 1	37.75	130	343	177.5	23.5	64	74.5	13.25
Colony 2	45.5	123	65	185.5	36.75	84.5	-14	26.25
Hour 6:								
Colony 1	69.75	261	874.5	469	83.5	168	169.75	19.5
Colony 2	84.75	258	92.25	494.25	78.25	189.5	182	47.25

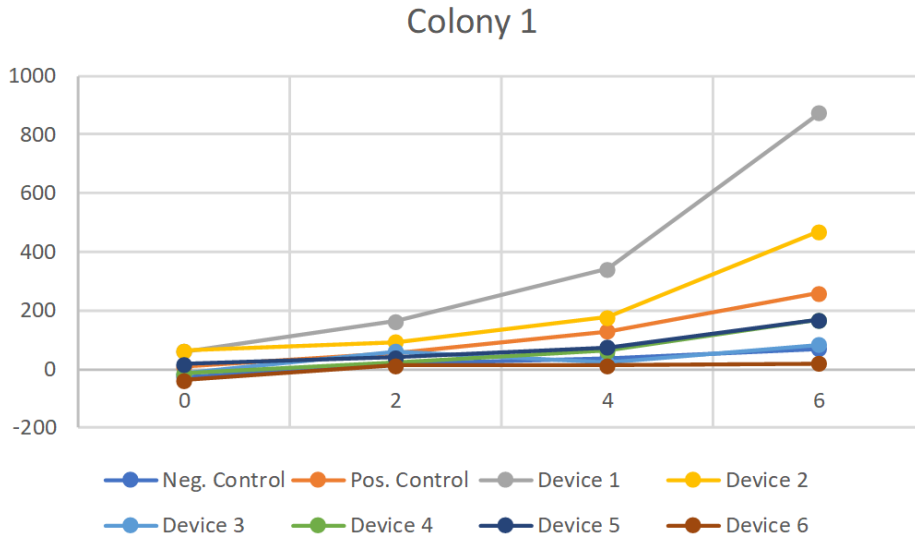


Figure 5. Blank subtraction and correction of Colony 1 fluorescence measurement.

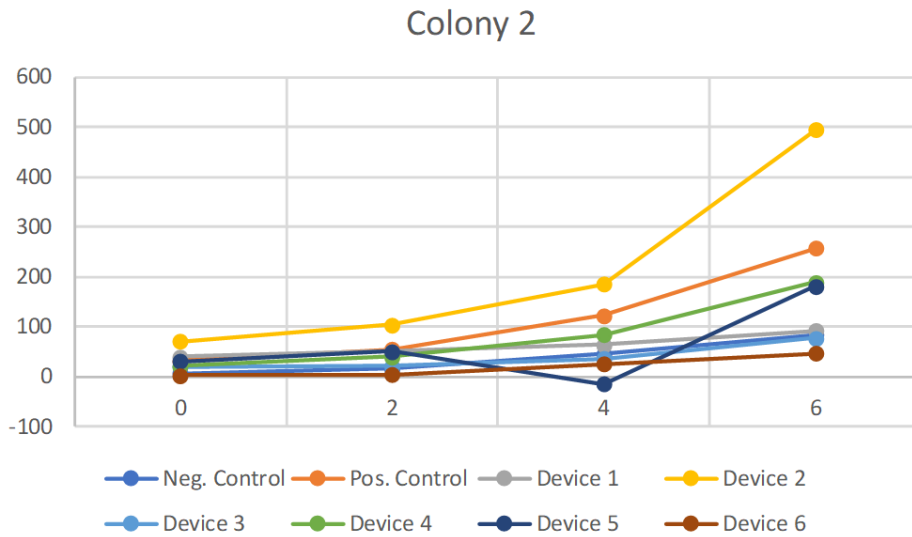


Figure 6. Blank subtraction and correction of Colony 2 fluorescence measurement.

Table 8. Raw data of FI/Abs600.

	uM Fluorescein / OD600			
Hour 0:	Replicate 1	Replicate 2	Replicate 3	Replicate 4
Negative Control (Colony 1)	-0.08613	-0.167173	-0.116654	-0.085397
Negative Control (Colony 2)	-0.07118	-0.075908	-0.063591	-0.053678
Positive Control (Colony 1)	0.08736	0.013017	-0.006799	0.0486453
Positive Control (Colony 2)	0.026953	-0.003014	0.047277	0.0572208
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 1)	0.642362	0.594834	0.587194	0.6722586
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 2)	1.715271	2.013092	2.181546	-2.805157
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 1)	0.291947	0.279486	0.286895	0.2615605
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 2)	0.278841	0.220757	0.147773	0.3295351
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 1)	-0.05016	-0.079757	-0.020541	-0.090495
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 2)	-0.04321	-0.027848	-0.038262	0.0340102
Test Device 4: J23101+13504 (Colony 1)	-0.34473	-1.082399	-0.182337	-0.108972
Test Device 4: J23101+13504 (Colony 2)	-0.23702	-0.156373	0.005513	0.1162579
Test Device 5: J23106+13504 (Colony 1)	0.063236	0.037629	0.113385	0.0978813
Test Device 5: J23106+13504 (Colony 2)	0.001423	0.005922	0.030097	0.0659729
Test Device 6: J23117+13504 (Colony 1)	-0.51486	-0.262819	-0.147234	-3.446897
Test Device 6: J23117+13504 (Colony 2)	-0.26816	-0.112979	-0.397965	-1.082399
Hour 2:				
Negative Control (Colony 1)	0.016241	-0.005302	-0.037949	-0.04987
Negative Control (Colony 2)	-0.01547	-0.023388	0.004154	-0.039813
Positive Control (Colony 1)	0.004873	0.115445	0.173509	0.139154
Positive Control (Colony 2)	0.086096	0.099976	0.092911	0.1423814
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 1)	0.571311	0.532755	0.610949	0.8361792
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 2)	1.361211	0.814989	0.930382	1.392105
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 1)	0.239322	0.214651	0.197627	0.2260499
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 2)	0.227692	0.224393	0.249456	0.3004054
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 1)	-0.01187	-0.009204	0.021347	0.7102357
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 2)	-0.00995	0.003758	-0.032904	0.0381636
Test Device 4: J23101+13504 (Colony 1)	0.371539	0.246787	0.280038	1.9460118
Test Device 4: J23101+13504 (Colony 2)	0.149961	0.119637	0.110723	0.1830084
Test Device 5: J23106+13504 (Colony 1)	0.138846	0.027396	0.069286	0.0343727
Test Device 5: J23106+13504 (Colony 2)	0.099794	0.097958	0.091347	0.0686968
Test Device 6: J23117+13504 (Colony 1)	-0.05001	-0.080133	-0.022908	-0.091556
Test Device 6: J23117+13504 (Colony 2)	-0.08138	-0.0264	-0.076899	-0.07889
Hour 4:				
Negative Control (Colony 1)	0.038324	0.036207	0.032482	0.0314146
Negative Control (Colony 2)	0.039539	0.042321	0.038329	0.046143
Positive Control (Colony 1)	0.197627	0.18385	0.184053	0.1955925
Positive Control (Colony 2)	0.146511	0.166046	0.141728	0.1836619
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 1)	0.800646	0.730166	0.882287	0.8801703
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 2)	0.822772	0.660147	0.777333	0.8877732
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 1)	0.30363	0.264208	0.285996	0.2417474
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 2)	0.294582	0.292089	0.308678	0.3210517
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 1)	0.028555	0.024006	0.041369	-0.076962
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 2)	0.023851	0.017789	0.031237	0.0348176
Test Device 4: J23101+13504 (Colony 1)	0.20715	0.171277	0.149661	0.104084
Test Device 4: J23101+13504 (Colony 2)	0.246403	0.152876	0.208443	0.2261379
Test Device 5: J23106+13504 (Colony 1)	0.109347	0.118013	0.089304	0.1002868
Test Device 5: J23106+13504 (Colony 2)	0.035608	-2.168349	0.137264	-0.288926
Test Device 6: J23117+13504 (Colony 1)	-0.01713	-0.015413	0.002818	-0.014391
Test Device 6: J23117+13504 (Colony 2)	-0.00514	0.011138	0.030493	0.0162939
Hour 6:				
Negative Control (Colony 1)	0.051636	0.05069	0.064079	0.0603795
Negative Control (Colony 2)	0.066603	0.060301	0.062636	0.0600697
Positive Control (Colony 1)	0.2648	0.263953	0.244473	0.2332233
Positive Control (Colony 2)	0.218544	0.229525	0.223881	0.2334594
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 1)	1.190537	1.106553	1.136753	1.0870751
Test Device 1: J23101.BCD2.E0040.B0015 (Colony 2)	0.48265	0.603805	0.372141	0.4020686
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 1)	0.483151	0.480327	0.47681	0.461106
Test Device 2: J23106.BCD2.E0040.B0015 (Colony 2)	0.461627	0.464643	0.520547	0.466207
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 1)	0.07389	0.059065	0.063396	0.0616238
Test Device 3: J23117.BCD2.E0040.B0015 (Colony 2)	0.064084	0.055071	0.063454	0.0690353
Test Device 4: J23101+13504 (Colony 1)	0.266083	0.26375	0.245656	0.2638652
Test Device 4: J23101+13504 (Colony 2)	0.283381	0.26975	0.257926	0.2878185
Test Device 5: J23106+13504 (Colony 1)	0.165655	0.153073	0.161029	0.1553268
Test Device 5: J23106+13504 (Colony 2)	0.179468	0.164691	0.16109	0.1724917
Test Device 6: J23117+13504 (Colony 1)	0.028208	-0.118689	0.017609	0.0270925
Test Device 6: J23117+13504 (Colony 2)	0.034424	0.041479	0.031819	0.034282