

# Effects of artificial algal-bacterial symbioses (E. Coli K-12, C. Fruendii, & E. Coli MC4100) on microbial hydrogen production

Samara Rashid, Brittnee McDole, Jenny Ko

Department of Science, American Heritage School Palm Beach, Delray Beach, Florida, United States, 33414

## Supporting information



**Figure S1.** Set-up for the 24 hours hydrogen generation period. Arranged vials in a 6x4 rectangle, each row of 6 being one category, with each vial labeled appropriately. 24 hours was chosen both for practicality as well as previous literature indicating this was when hydrogen production peaked [5].

**Table S1.** ANOVA test run to verify overall statistical significance. Essentially confirms that the means of each category are different enough from each other and the control that the independent variable did have an effect.

ANOVA: Single Factor								
DESCRIPTION				Alpha		0.05		
Group	Count	Sum	Mean	Variance	SS	Std Err	Lower	Upper
Pure algae	7	0.7105	0.1015	7.00833E-05	0.0004205	0.007075276	0.086786159	0.116213841
E. Coli, wild typ	4	0.715333333	0.178833333	4.67222E-05	0.000140167	0.00935971	0.159368751	0.198297915
C. Fruendii / alga	7	0.96425	0.13775	0.001033729	0.006202375	0.007075276	0.123036159	0.152463841
E. Coli MC4100	7	0.930416667	0.132916667	9.92847E-05	0.000595708	0.007075276	0.118202826	0.147630508
ANOVA								
Sources	SS	df	MS	F	P value	Eta-sq	RMSSE	Omega Sq
Between Group	0.015505704	3	0.005168568	14.74977778	2.15137E-05	0.678157631	1.69640142	0.622637712
Within Groups	0.00735875	21	0.000350417					
Total	0.022864454	24	0.000952686					

**Table S2.** Dunnett's test run to verify statistical significance specifically between each experimental group and the control. Shows that, using an alpha value of 0.5, each symbiote had a significant or non-negligible effect on hydrogen production.

DUNNETT'S TEST		alpha		0.05				
group	mean	size	ss	df	d-crit			
Pure algae	0.1015	7	0.0004205					
E. Coli, wild typ	0.178833333	4	0.000140167					
C. Freundii / alg	0.13775	7	0.006202375					
E. Coli MC410	0.132916667	7	0.000595708					
		25	0.00735875	21	2.531			
D-TEST								
group	mean	std err	d-stat	lower	upper	p-value	mean-crit	Cohen d
E. Coli, wild typ	-0.077333333	0.011733017	6.591086727	-0.1070296	-0.047637067	0	0.029696266	4.131182236
C. Freundii / alg	-0.03625	0.010005951	3.622844187	-0.061575061	-0.010924939	0	0.025325061	1.936491673
E. Coli MC410	-0.031416667	0.010005951	3.139798295	-0.056741728	-0.006091606	0.01318303	0.025325061	1.678292783