

# **Supplemental Material**

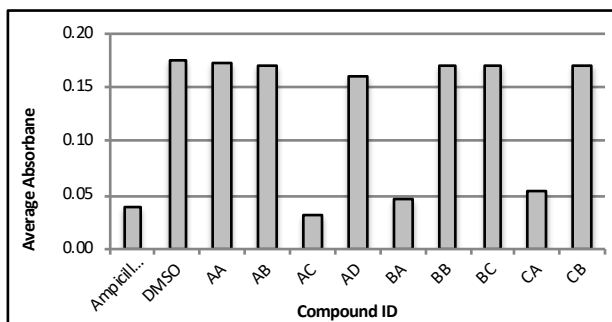
*CBE—Life Sciences Education*

Paine and Knight

### Supplemental Figure 1: Data Analysis Assignment 2

Students at the University of Tallahassee, working in a discovery lab much like this one, have been running drug screens on *Salmonella*. Just like in our protocol, students cultured *Salmonella* in the presence of a single compound (library compound or control) and determined the absorbance of the surviving *Salmonella* after treatment. A subset of the data they have collected is shown below.

Test	Compound ID	Drug Absorbance	Ampicillin Absorbance	DMSO Absorbance
1	AA	0.162	0.034	0.193
2	AA	0.181	0.053	0.184
3	AA	0.172	0.046	0.194
4	AA	0.178	0.033	0.183
1	AB	0.161	0.032	0.183
2	AB	0.174	0.032	0.193
3	AB	0.177	0.044	0.189
4	AB	0.161	0.026	0.194
1	AC	0.032	0.046	0.201
1	AD	0.152	0.036	0.193
2	AD	0.166	0.032	0.182
3	AD	0.165	0.037	0.197
4	AD	0.154	0.046	0.159
1	BA	0.041	0.047	0.079
2	BA	0.052	0.037	0.054
3	BA	0.046	0.029	0.067
1	BB	0.164	0.047	0.181
2	BB	0.163	0.029	0.178
3	BB	0.174	0.049	0.199
4	BB	0.182	0.036	0.183
1	BC	0.166	0.038	0.182
2	BC	0.174	0.041	0.192
3	BC	0.172	0.045	0.209
1	CA	0.051	0.043	0.179
2	CA	0.042	0.031	0.184
3	CA	0.066	0.031	0.177
1	CB	0.164	0.055	0.181
2	CB	0.163	0.031	0.178
3	CB	0.174	0.032	0.199
4	CB	0.182	0.041	0.183



**Figure 1. Distribution of Compound Absorbances.** *Salmonella* were exposed to compounds individually. The absorbance of 600 nm light was measured for each sample after 24 hours. Bars represent the average absorbance for each compound.

**Table 1: Original data.** Raw absorbance values.

**What conclusions can you draw from this data? Include your claim(s), evidence, and reasoning.**

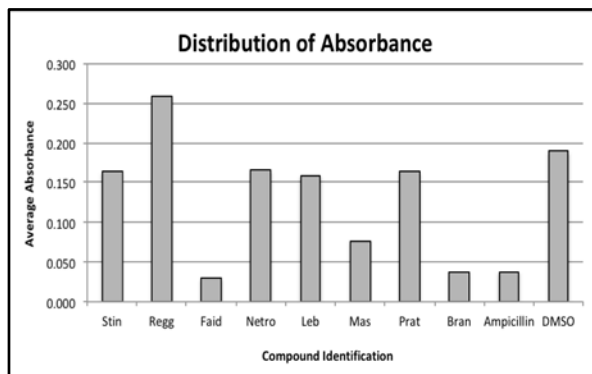
**Supplemental Figure 1:** Students completed the data analysis assignment 2 in groups as part of their week 8 course work. A physical copy of the assignment was given to each student group, along with an audio recorder, at the beginning of the lab period. Students were asked to discuss the data and answer the questions while audio-recording their discussion.

### Supplemental Figure 2: Data Analysis Assignment 3

Researchers at a high school in Maryland have conducted a drug screen on a harmless strain of *Mycobacterium*. Three students tested each drug and each student repeated the experiment two times. They cultured *Mycobacterium* in the presence of a single compound (library compound or control) and determined the number of surviving *Mycobacterium* after treatment. The averages of these results are shown below.

Compound Identification	Average Drug Absorbance	Standard Deiation
Stin	0.163	0.007
Regg	0.259	0.101
Faid	0.030	0.001
Netro	0.165	0.029
Leb	0.159	0.023
Mas	0.077	0.097
Prat	0.163	0.006
Bran	0.037	0.004
Ampicillin	0.038	0.002
DMSO	0.189	0.009

**Table 1: Average Absorbances.** Average absorbance of each compound tested in triplicate by 2 students. Standard deviation for data collected also shown in the final column of the table.



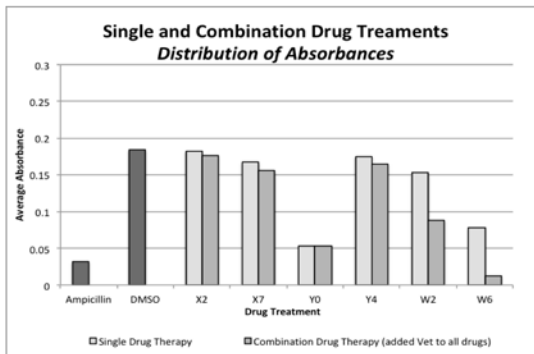
**Figure 1. Distribution of Compound Absorbances.** *Mycobacterium* were exposed to compounds individually. The absorbance of 600 nm light was measured for each sample after 24 hours. Bars represent the average absorbance for each compound.

**What conclusions can you draw from this data? Include you claim(s), evidence, and reasoning.**

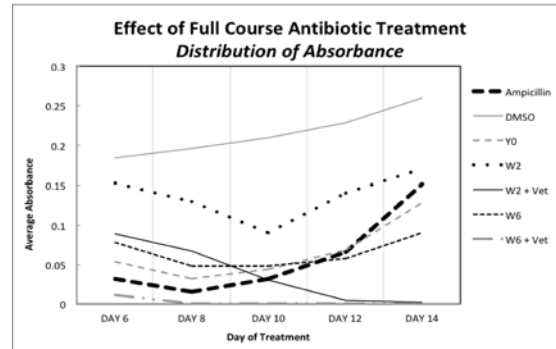
**Supplemental Figure 2:** Students completed the data analysis assignment 3 in groups as part of their week 11 course work. A physical copy of the assignment was given to each student group, along with an audio recorder, at the beginning of the lab period. Students were asked to discuss the data and answer the questions while audio-recording their discussion

### Supplemental Figure 3: Data Analysis Assignment 4

Students at Philadelphia University are in their second semester of drug screens for antibiotics against *Salmonella* in mice. In the first semester of the course the class discovered that a compound called Vet was able to cause a significant decrease in the growth of *Salmonella*. This semester students wanted to focused on compounds X2, X7, Y0, Y4, W2, and W6 , as these had similar chemical structure to Vet. Also, because they already know Vet is an effective compound, students wanted to run combination drug treatment trials. The results of both the single and combinational trials are shown below (**experiment 1**). Students in one of the groups wanted to investigate these compounds further, so they chose a few they though had interesting results and ran a time trial, this data is also shown below (**experiment 2**).



**Figure 1: Single and Combination Drug Treatment.** A *Salmonella* infection was treated in mice with the compounds listed for 6 days. **Light bars:** represent *Salmonella* grown in the presence of the single compound. **Dark bars:** represent *Salmonella* grown in the presence of the compound AND the drug Vet. The absorbance of 600 nm light was measured for each sample after 6 days. Bars represent the average absorbance for each compound.



**Figure 2: Effect of Full Course Antibiotic treatment.** Drugs considered to be of interest (both individual and combinational) were then tested in mice infected with *Salmonella* for a full 14 antibiotic treatment course. The absorbance of 600nm light was measured for each sample every 2 days. Tread lines represent the average absorbance for all samples for each compound tested.

**What conclusions can you draw from this data? Include you claim(s), evidence, and reasoning.**

**Supplemental Figure 3:** Students completed the data analysis assignment 4 in groups as part of their week 14 course work. A physical copy of the assignment was given to each student group, along with an audio recorder, at the beginning of the lab period. Students were asked to discuss the data and answer the questions while audio-recording their discussion